THE SYSTEM OF AYURVEDA

BY
SHIV SHARMA
(AYURVEDACHARYA)

KHEMRAJ SHRIKRISHNADASS

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Dedicated
To
MY REVERED FATHER

VAIDYA RATNA
PANDIT RAM PRASAD
RAJ VAIDYA OF PATIALA

Pt. Shiv Sharma, Ayurvedacharya.

PREFACE

The present volume is a part of the introduction, I intended to write to an English translation of *Charaka Samhita,* which I have undertaken. As the translation might take several years to complete, it was thought proper to publish this part of the introduction as a separate volume, with slight modifications.

Ayurveda is a rich heritage. It is a vast scientific system. But its very vastness and the language in which it is treasured make it a sealed book not only to the foreigner, but even to the present day intelligentsia of our own country, There is hardly any book on Ayurveda in English, which apart from serving as an apologia, actually describes the whole system of Ayurveda in a brief compass.

The Indian renaissance has brought in its train a growing interest in this most ancient system of medicine and it is hoped that the book would supply a much needed demand.

Further, this growing interest in Ayurveda has caused a flutter in the dovecotes of the professors of the Western system of medicine who; have stared a campaign of belittling, even of positive vilification of Ayurveda, which ignorance and self-interest alone can breed. It is a sinister propaganda and it is time that our cultured countrymen for whom it is primarily meant (for the vast majority of the country still have faith in our old system) should know the value of what they are asked to sacrifice.

The authorities on which the quotations of the text are based are *Charaka, Sushruta, Vagbhata,* and my father Vaidya Ratna Pandit Ram Prasad's Sanskrit treatise-*Ayurveda Sutra.*

I have acknowledged my debt to the authors, from whom I have quoted in the course of the book. I should specially mention my indebtedness to the works of Mr. Sharda, Messrs. K. L. Bhishagratna and A.C. Kaviratna, the translators of *Sushruta* and *Charaka,* and Dr. B. N. Seal, without whose work. *The Positive Sciences of the Ancient Hindus*, it would have been difficult for me to deal with the

evolution theory of the Ayurvedists. I should not also forget to mention the name of Pandit Hari Sharma Shastri B.A., whose gift of Oriental scholarship along with his continued company with me helped me a great deal in the completion of the work.

I cannot thank too much my learned teacher, Professor K. C. Bose, M.A., B.L., for having very kindly gone through the MS. but for whose advice the work would have lost much of its value.

SHIV SHARMA.

Sharma Lodge,
Patiala.
Dated : 18th June 1929.

CONTENTS

PAGES

Preface v

Contents viii

Chap. I.
India the Cradle Land 1

Chap. II.
The Arts & Sciences of the Hindus 19

Chap. III.
The First Medical System of the World 37

Chap. IV.
The Scope & Scientific Nature of Ayurveda ... 49

Chap. V.
The Fundamental Principles of Ayurveda-I ... 79

Chap. VI.
The Fundamental Principles of Ayurveda II ... 113

Conclusion 150

Appendix–A 153

Appendix–B 164

Appendix–C 171

THE SYSTEM OF AYURVEDA

CHAPTER I

INDIA, THE CRADLE LAND

And now I salute thee, with veneration and wonder, ancient INDIA of whom I am the adept, the India of the highest splendours of art and philosophy . . . . May thy awakening atonish the Occident, decadent, mean, daily dwindling, slayer of nations, slayer of gods, slayer of souls, which yet bows down still, ancient India, before the prodigies of thy primoidial conceptions : —

Mons. Pierre Loti.

The Indian renaissance has brought to light a legion of Sanskrit books embracing a very wide area of art and literature, and sciences, and the idea, so popular in the West, that all that ancient India could boast of was but a reflection of early Greek civilisation, began to dwindle and lose its hold upon the minds of the people. The recent discoveries at Harappa, Mohenjo Daro, Taxila, etc., have opened further a new field of research and 'layer beneath layer of ancient cities each built on the ruins of its predecessors' take back the period of Indian civilisation to 7000 B.C. — 9000 B.C. Dr. Muthu tells us on the authority of Sir John Marshall, now unearthing, "the secret of a forgotten people and their prehistoric civilisation", that the gold ornaments found at Taxila etc., are so well finished and so highly polished that they might have come out of a Bond Street jeweller's of today

rather than from a pre-historic house of 5000 years ago. "They have exhumed many of the ancient streets and dwelling houses or shops furnished with their own wells and bathrooms, floored over with brick, and provided with covered drains leading into the side streets. In fact the existence of roomy and well-built houses with bathrooms, of an extraordinarily well-built system of drainage, the character of jewellery and other antiquities, betray a relatively high degree of luxury and social condition of the people much in advance of what was then prevailing in Mesopotamia or Egypt."[1]

Even without these facts, internal evidence was not lacking to prove India's priority when the claim of the priority of Greek Civilisation was made. This claim, it may be noted, was due to a certain extent, to the influence of the conclusion arrived at by earlier workers in the field, who were mostly unacquainted with Sanskrit. There was yet another potent factor, that cannot be altogether ignored, viz., the general prejudice that existed—and still exists—of the Western people against the East in general and India as a subject nation in particular. The political subjection of India, today, stands as a formidable barrier to an impartial and scholarly appreciation of her well-founded claims to cultural superiority in ancient days. When Prof. Max Muller pleaded for this unfortunate country at Oxford, he described the unpleasant attitude of these people against all that was Indian. Their amount of contempt would be well illustrated by the following extract from his first lecture of the well known series entitled, *India, What Can It Teach Us*.

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[1] Antiquity of Hindu Medicine Dr. Muthu.

"Why should a study of Greek and Latin — of the poetry, the philosophy, the laws and the art of Greece and Italy — seem congenial to us, why should it even excite a certain enthusiasm, and command general respect, while a study of Sanskrit and of ancient poetry, the philosophy, the laws, and the art of India is looked upon, in the best case, as curious, but is considered by most people as useless, tedious, if not absurd."

"And, strange to say, this feeling exists in England more than in any other country. In France, Germany, and Italy, even in Denmark, Sweden, and Russia, there is a vague charm connected with the name of India. One of the most beautiful poems in the German language is the *Weisheit des Brahmanen,* the Wisdom of Brahman by Ruckert, to my mind more rich in thought and more perfect in form than even Goethe's *West-ostlicher Divan* A scholar who studies Sanskrit in Germany is supposed to be initiated in the deep dark mysteries of ancient wisdom, and a man who has travelled in India, even if he has only discovered Calcutta, or Bombay, or Madras, is listened to like another Marco Polo. In England a student of Sanskrit is considered a bore, and an old Indian Civil servant, if he begins to describe the marvels of Elephanta or the Towers of Silence, runs the risk of producing a count-out.

"There are indeed a few oriental scholars whose works are read, and who have acquired a certain celebrity in England, because they were men of really uncommon genius, and would have ranked among the great glories of the country, but for the misfortune that their energies were devoted to Indian literature — I mean Sir William Jones, 'one of the most enlightened of the sons of men' as Dr. Johnson

called him, and Thomas Colebrooke. But the names of others who have done good work in their day also, men such as Ballantyne, Buchanan, Carey, Crawford, Davis, Elliot, Ellis, Houghton, Leydon, Mackenzie, Muir, Princep, Rennel, Turnour, Upham, Wallich, Warren, Wilson, and many others, are hardly known beyond the small circle of Oriental scholars, and their works are looked for in vain in libraries which profess to represent with certain completeness the principal branches of scholarship and science in England.

"How many times when I advised young men, candidates for the Indian Civil Service, to devote themselves before all things to a study of Sanskrit, have I been told, 'What is the use of our studying Sanskrit? There are translations of *Sakuntala, Manu and the Hitopadesha,* and what else is there in that literature that is worth reading? Kalidasa may be very pretty, and the Laws of Manu are very curious, and the fables of Hitopadesha are very quaint, but you would not compare Sanskrit literature with Greek, or recommend us to waste our time in copying and editing Sanskrit texts which either teach us nothing that we do not know already, or teach us something which we do not care to know?'

"This seems to me a most unhappy misconception, and it will be the chief object of my lectures to remove it, or at all events to modify it, as much as possible. I shall not attempt to prove that Sanskrit literature is as good as Greek literature Why should we always compare ? A study of Greek literature has its own purpose, and a study of Sanskrit literature has its own purpose; but what I feel convinced of, is that Sanskrit literature, if studied only in a right spirit, is full of human interest, full of lessons which even Greek could never teach us, a subject worthy to occupy the leisure, and more than the

leisure, of every Indian Civil servant; and certainly the best means of making any young man who has to spend five–and–twenty years of his life in India, feel at home among the Indians as a fellow–worker among fellow workers, and not as an alien among aliens. There will be abundance of useful and most interesting work for him to do, if only he cares to do it, work such as he would look for in vain, whether in Italy or in Greece, or even among the pyramids of Egypt or the palaces of Babylon.

"If I were to look over the whole world to find out the country most richly endowed with all the wealth, power and beauty that nature can bestow—in some parts a paradise on earth—I should point to India. If I were asked under what sky the human mind has most fully developed some of its choicest gifts, has most deeply pondered on the greatest problems of life, and has found solutions of some of them which well deserve the attention even of those who have studied Plato and Kant—I should point to India. And if I were to ask myself from what literature we, here in Europe, we who have been nurtured almost exclusively on the thoughts of Greeks and Romans, and of one Semitic race, the Jewish, may draw that corrective which is most wanted in order to make our inner life more perfect, more comprehensive, more universal, in fact more truly human, a life not for this life only, but a transfigured and eternal life—again I should point to India."

That India has been denied her claims only on account of her present subjection is clear from this fact that Englishmen, who have a closer knowledge of India's dependent character, have done greater injustice to Indian art and literature, as Prof. Max Muller openly declared in their midst, than any

other Westerner. By a reversal of the old saying, the fathers have suffered for the sins of their children, and the greatness of ancient India has not been recognised because of Modern India. This unfortunate state of affairs is largely responsible for the lagging behind of present day India in the race of intellectual progress so evident in modern times. "Today," writes Mr. Krishna Shastri, "in the name of civilisation, the struggle for life is growing keener and keener, and literary activities receive but scant attention. The greatest achievement of the day consists in the wringing out of the unwilling hands of Government small concessions such as the lowering of the price of salt by a quarter of an anna or the abolition of the drink, an admitted curse of society. The best intellect of the country is thus utilised in securing small things of, no doubt, practical value, but, which do not, after all, count for much in taking stock of the real wealth of a nation." [1]Thus it is that the best brains of India, capable of attaining the highest celebrity in the fields of art and science have been wasting their energies on making the lives of their countrymen worth living, at least to the extent they are capable of doing so, and this is work enough for their whole lives. In spite of all these handicaps and depressing conditions, Indian scholars like Mr. Tilak, Sir J. C. Bose, Dr. Ray, Dr. Mukerjee, etc., whom India shall ever remember with gratitude and thankfulness, exhorted the administration by their achievements to turn their attention to ancient India. They worked to unveil the glorious past of India that had long been hidden under the accumulated ignorance of the ages, and the prejudice of the disciples of the Hellenic civilisation. Their

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[1]. **Preface to Shri Siva Tattva Ratnakara.**

genuine efforts based on facts overthrew the antagonism founded on far fetched and laboriously worked theories.

Needless to say that this ignorance still prevails in the field of Indian medicine to a considerable extent. It would be our purpose to prove that not only is this medicine the oldest but its development was entirely independent of any foreign influence, and even at the present day, after the lapse of ages, it is not inferior in quality to any modern system of medicine. Indian Medical Science is almost as old as Indian civilisation itself. It will not be out of place, therefore, to briefly go over a few facts connected with the antiquity of Indian civilisation, which help to show that nothing whatsoever was borrowed by her from any other source foreign to her soil.

Mr. U. P. Krishnamacharya of Benares[1] states on the authority of Medlicott, Blanford, Lapworth, Dr. Karl, and other geologists of note, that the Vindhyas are the latest Azoic rocks of India, and of pre-Cambrian or Algonkian age, which proves India to be a land area in the latest Azoic times, somewhere between 70,000,000 and 60,000,000 years. They attribute the beginning of life to the beginning of the Cambrian age, in the particular stratum of the earth's crust known as the Olenellus Bed. There are signs of life in other parts of the world also in the same stratum, but in certain places in India, such as the Salt Range of Punjab, there are species found nowhere else, *Olenus Indicus, Orthis Warthi and Ptychoparia Warthi*, deeper than the Olenellus Neobolus Bed, and therefore indicate the presence of life in India prior to any other part of the globe. Edward Clodd records the discovery of the sign of primitive man in Further India, which

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1 . Ramadutta Reprints

is further corroborated by the fossils and the evidently human implements found in the beds of the Narmada and the Godavari and the Cuddapah deposits, etc. Mr. Avinash Chandra Das conclusively proves "that men were living already in a high state of civilisation several ages ago when ... the Arabian Sea stretched far and wide, covering a large part of the present day Rajputana, and another great ocean covered the regions in the North of the Himalayas, of which now certain portions alone have remained after a long drying up, like the Aral Sea." Thus we find that India is not only the first land area, but the primitive abode of life of all kinds including man.

The Vedas do not mention any place outside India as the origin of the Aryans. The praises addressed to the *Sindhu and the Saraswati* show the psychology of the *Rishis* to be completely native to India. Saraswati is called the 'best of mothers', *ambitamam*; for the most ancient *Rishis*, the eight *Kulapatis* (Lords of Creation), performed the *yajna* on her banks and from them produced all the species of organic life (*yonis*). Amongst the hoary titles of India is *Saptasindhava* or the Land of Seven Rivers. Mostly they are Indian rivers as listed, and Kabul is placed towards the end of the list. This has misled many scholars to think that the acquaintance of the Aryans with this river associates their origin with Central Asia, but this very fact, if viewed aright would rather prove the reverse; for it is natural for the human mind to proceed from the known to the unknown, the more known to the less known. And this law is recognised in the science of Rhetoric and the science of the Logic. Thus, if ever a geographical list can aid historical discoveries of human migrations, the direction of migration, according to this list, is towards

Kabul, rather than from her banks. The two ancient names, *Deva-nirmitam-desam* (God-fashioned-land) and *Aryavarta* (The Land of the Aryan Origin) is a strong argument in favour of original Indian Home of the Aryans, for the latter name could not be given to India by foreigners. The Himalayas were called *Uttaram Girim* i.e , Northern Mountains. In case they had been foreigners they should have called these mountains 'Eastern' or 'Southern' instead of the 'Northern' mountains. This too proves that the earliest Aryans were conscious of the fact that they were ever the natives of India and no other foreign country. The references in ancient Sanskrit works to the expulsion of various tribes, or of Aryans seeking home of their own accord, etc., show that the tendency to migration was not extinct in the ancient times.

The traditions and legends of a nation discovered by the indefatigable efforts of historical research help us a great deal to bridge the gulf of time and to be acquainted with factors as might throw light on its customs, and manners, and above all origin and antiquity. All the ancient nations that are supposed to approach India in the question of antiquity have something to tell of their foreign home whence they were led by their Gods or forefathers to their respective places. India alone has traditions that do not go beyond her boundaries. Even her heaven does not go beyond the Himalayas. Below are quoted the traditions of a few ancient races out of many mentioned by Mr. U. P. Krishnamacharya in his *Essays on Ancient India*.

"The Persians hold in their sacred works (*Vendidad, Zend Avesta*) that their forefathers migrated to Persia from their original home known to them as *Hepta Hendu. Airyana*

Vaejo, another home which they believed was not as ancient as their *Hepta Hendu (Sapta Sindhu)*.

" The Egyptians believed traditionally that their ancestors lived originally in the sacred *Land of Punt* on the shores of the great Eastern Sea from where they migrated, aided by their Gods, and finally settled on the bank of the Nile."

" The Greeks were perpetuating from the ancient past a tradition that their forefathers in several batches came by a Northern route and settled in the various compartments like parts of Greece, Athens and Sparta. King Cadmus was thus the last in the line of the leaders of the Athenian Branch. The Pelasgians, whom the settlers of Greece drove before them also had a tradition among them that they were immigrants in that land having been led from their original home in the far East by a gifted leader called by them Gaya."

"The Latians thought that they migrated to Latium (an ancient province in Italy) from the Asiatic coast subsequent to the fall of Troy and the historically famous Romans were only a sect among these Latians.

"The Scandinavians distinctly hold that their progenitors were immigrants in that peninsula having wandered under much trial and danger from their far off home in the East and led by their chief called by them Gotma."

"The Druids of Great Britain were remembering that they were merely settlers there and wore a crescent mark to denote their descent from the lunar race while they were in their fatherland."

"The Phoenicians whom the Western nations knew to have in the beginning lived in Phoenicia never believed that

they originally lived there, but thought that they colonised that country from their Eastern home and that they in the past ages prospered in that home for unnumbered ages since the time of creation. They gave a conception of their age which resembles the Aryan conception."

"The Aztecs of Mexico in America said that their ancestors came from a far off home on the shores of the great Eastern Sea, and settled in Mexico. In fact it was this belief of theirs that Cortes, their cunning conqueror, used as his trick to win the goodwill of the Aztec Emperor Montezuma by stating that he hailed from their fatherland."

Thus we find, that while all the nations of the world describe their ancestors to be early immigrants from some Original Home, India alone, according to her traditions, has ever been the Home of her people. Overwhelming references clearly express, without any attempt at distortion of meaning or interpretative trouble, in all ancient *Smritis*, *Puranas* etc., that the very creation of the organic life for the first time occurred in the *Aryavarta*, the Land of the Aryan Origin, especially in its north-western parts where still flow the famous rivers, specially the Indus and the Saraswati, now almost dried up, but once a mighty river system. The ancient Sanskrit works give an accurate geographical description of the Cradle Land, mentioning all the important rivers and mountains, in order to remove finally the last traces of misgivings. When this dearth of texts admitting foreign origin of the Hindus is considered side by side with the numberless references which unmistakably prove India to be their original home — an irresistible conclusion will be forced upon us that so far as the theological and legendary evidences are concerned, India must be the Cradle of the human race. While

all the nations point out to a distant place as their original home, the Original Home of Mankind should be sought in that land where traditions ever fixed the abode of her people. Also the traditions of India contain within their womb the germ of almost all kinds of customs and manners of every nation worthy of note. The differences that exist today were due to the change of environments, and the consequent adaptation as a result of those surroundings on the mind and body of Man. This leaves it unnecessary to suppose that different types of humanity must have arisen independent, in order to explain the differences. Prof. James De Dana in his *Manual of Geology* writes: "Man's capability of spreading to all lands and of adaptation to all climates renders creation in different localities over the globe eminently unnecessary and directly opposed to his own good. It would be doing for man what man could do for himself. It would be contracting the field of nature before him in nature, and thereby lessening his means and opportunities of development."

The civilisation of China is considered as one of the most ancient by Western scholars. But Chinese civilisation itself according to some Western scholars is an offshoot of ancient Indian civilisation. Prof. Terrien de Lacouperie, in his *Western Origin of the Early Chinese Civilisation*, and Prof. Douglas believe that some 2500 years ago, *Brahmans*, *Kshatriyas* and *Vaishyas* had colonised the parts of China and founded powerful kingdoms there. The Indian merchants much honoured by the Chinese courts, increased the relations of Indians with those trans-Himalayan colonists, and founded a great trade emporium in China naming it Lanka, which laterly corrupted to *Lang-ya*. Many of the Chinese

astronomical terms are of Indian origin according to V. A. Smith.

The following extracts will give an idea of how some of the best scholars of antiquity have subscribed their view to the independent development of the Indian civilisation: —[1]

Mr. Elphinstone in his History of India, Vol. 1, writes, "It is opposed to their foreign origin that neither in the Code of Manu, nor I believe, in the Vedas, nor in any book that is certainly older than the Code, is there any allusion to a prior residence, or to a knowledge of more than the name of any country out of India. Even mythology goes no further than the Himalayan chain in which is fixed the habitation of the Gods."

"The Sanskrit is in itself the most irrefutable and most simple proof of the Indian origin of the races of Europe and of India's maternity."—Mons. Louis Jacolliat's *Bible in India*.

"I must however begin with a candid admission that, so far as I know, none of the Sanskrit books, not even the most ancient contain any distinct reference or allusion to the foreign origin of the Hindus." Muir's *Original Sanskrit Text*, Vol. II.

Mr. Curzon, in the Journal of the Royal Asiatic Society, Vol. XVI, states : "No monuments, no records, no traditions of the Aryans ever having originally occupied as Aryans any other seat, so far as can be ascertained to the present time, than the plains to the South-West of the Himalayan Chain, bound by the two seas defined by Manu...memorials (such) as

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[1] Essays on Ancient India.

exist in the histories of other nations well known to have migrated from their primitive homes....., can be found in India."

Mr. Pococke, whose inestimable services to India in removing the misconception regarding the Hellenic influence on her past cannot be repaid by any amount of gratitude, and whom I shall have to refer again in the course of this essay, states in his *India in Greece*, "The mighty human tide that passed the barrier of the Punjab rolled onward towards its destined channel in Europe and in Asia to fulfil its benevolent office in the moral fertilisation of the world."

Count Bjornstjerna, in his *Theogony of the Hindus* writes, "It is here (in India) we must seek not only for the cradle of the Brahmin religion, but for the cradle of the high civilisation of the Hindus which gradually extended itself in the West to Ethiopia, to Egypt, to Phoenicia; in the East to Siam, to China, to Japan; in the South to Ceylon, to Java, to Sumatra; in the North to Persia, to Chaldea, to Colchis, whence it came to Greece and to Rome and at the length to the remote abode of the Hyperboreans."

Mons. Leon Delbos read a paper on Vedas before the International Literary Association of Paris, on 14th July 1884, Victor Hugo being in the chair, in which he stated, "The influence of that civilisation, worked out thousands of years ago in India, is around and about us every day of our lives. It pervades every corner of the civilised world. Go to America and you will find there as in Europe the influence of the civilisation which originally came from the banks of the Ganges."

"If there is a country on earth which can justly claim the honour of having been the cradle of the human race, or at least the scene of primitive civilisation, the successive developments of which carried into all parts of the ancient world, and even beyond, the blessings of knowledge, that country is assuredly India." (Cruiser)

The Hon. Alex. Del Mar, who argues for the Aryan civilisation to have spread in America, writes, "This opinion is based upon the fact that several images of Buddha or Krishna have been found in the American Mounds."

The subject of the independent origin and development of Hindu civilisation and emigration of clans from India, then a very thickly populated country, [1] to colonise different parts of the world has now been dealt with on an extensive scale by various authors of different nationalities with eminent success. The colonisation of Egypt occurred about 8,000 years ago. Cuvier and Tod demonstrate the Hindu colonisation of Africa, and that of Ethiopia is supported by the testimony of Philostratus, Eusebius, and Julius Africanus. Turkistan was peopled by the Hindus; and the Turanians, according to Tod and Max Muller, are of Hindu origin. "Turvas and his descendants who represent Turanians are described in the later epic poems as cursed and deprived of their inheritance," and hence their emigration. The Yadus of Jaisalmer claim Chagtaes as of their own Indian stock, and Col. Tod deems this "worthy of credit." The Afghans are the descendants of Aphghana, the serpent tribe of *Apivansa* of ancient India. *Samoyedes* and *Tchoudes* of Siberia and Finland are really *Sama-Yadus* and *Joudes* of India. The

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[1] H. B. Sarda's Hindu Superiority.

Scandinavians (Scanda Nabhi) are the descendants of *Kshatriyas*; their sacred book *Edda* informs us that the *Getes* or *Jits* who entered Scandinavia were called *Asi* (*Aswas* of the Indu race) and their first settlement was the *Asigard* (*Asigarh*, or the Fortress of the *Asi*). The Druids of Ancient Britain were *Buddhas* and ancient Germans were colonists from India. The origin of the Burmese and the Tibetan civilisation is traced to India, and Chinese themselves assert their Hindu origin. "According to the traditions noted in the *Schuking*, the ancestors of the Chinese, conducted by Fo-hi came to the plains of China 2900 years before Christ fiom the high mountain land that lies to the North-West of the country. This shows that the settlers into China were originally inhabitants of Kashmir, Ladakh, Little Thibet, and the Punjab, which were parts of Ancient India. In the days of *Mahabharata* and long after, Afghanistan was a part of *Aryavarta*. The Raja of Kandhar (*Gandhara*) was a Hindu, and his daughter Khandhari or Gandhari was the mother of *Duryodhana*. Hindu Kings ruled in Kabul till the sixth century A.D." Count Bjornstjerna says "with certainly that religion of China came from India." Col. Yule in his *Cathay and the Way Thither*, proves constant intercourse between India and China. The distinguished Japanese scholar, Mr. I. Taka Kusu, relates how a Brahman Bodhisen Bharadwaja, known generally as the 'Brahman Bishop 'came' with another priest from India *via* Champa (Cochin China) to Osaka, then to Nara, where they met another Indian ascetic and taught Sanskrit to the Japanese. (H. B. Sarda's *Hindu Superiority*)

His (*Bharadwaja's*) monastery and tombstone with a written eulogy, still exist in Nara. Just at this time a Japanese

alphabet or syllabary is said to have been invented. The fifty syllables, *Gojuin*, are arranged by a hand evidently with a practical knowledge of Sanskrit method. (Journal of the R.A.S. for 1905, pp. 872—73).

"Cotton was introduced in Japan by two Indians" vide Dr. Taka Kusu's *What Japan owes to India*.

"It has been shown by the extensive remains of the cities, fortresses, and magnificent buildings in the southern continent of America, that it enjoyed a splendid civilisation at one time long before the modern civilisation of Europe made its appearance there. Dr. Zerfu in his *Manual of Historical Development of Art* remarks, "We find the remarkable temples, fortresses, viaducts, aqueducts, of the Aryan group." "Baron Humboldt," as Coleman tells us in *Hindu Mythology*, "the great German traveller and scientist, describes the existence of Hindu remains still found in America." Rama and Sita are still worshipped in America under their original names. "It is ridiculous," says Col Tod, "with all the knowledge now in our possession to suppose that Hindus always confined themselves within their gigantic barriers, the limits of modern India."

The religious books of the Hindus are said to have prohibited the Aryans from crossing the waters, and leave their original home, but, "the most authoritative as well as the most ancient work in Indian literature", says H. B. Sarda, 'the Veda, enjoins mankind to go to foreign countries in steamers and airships. The Yajur Veda (Adhyaya 6, Mantra 21) says:—

समुद्रङ्गच्छ स्वाहा, अन्तरीक्षङ्गच्छ स्वाहा देवं सवितारङ्गच्छ स्वाहा ।

"Oh men, who are fit to do administrative work righteously, go to the seas in big and fast going steamers, and to the high heavens in airships built on scientific principles."

"Manu says, with regard .0to the adjudication of disputes regarding the amount of fares:—

समुद्रयानकुशला देशकालार्थदर्शिनः

स्थापयन्ति तु यां वृद्धिं सातत्राधिगमं प्रति ।

"The final decision as to what is the suitable fare will rest with traders who are fully acquainted with sea routes as well as land routes."

Again,

एतद्देशप्रसूतस्य सकाशादग्रजन्मनः

स्वं स्वं चरित्रं शिक्षेरन पृथिव्यां सर्वमानवः ।।

मनु. अध्याय २ श्लोक २० ।।

"Let mankind from different countries of the world acquire knowledge from the learned men born in this country. (India)."

CHAPTER II

THE ARTS AND SCIENCES OF THE HINDUS

It (Sanskrit) was an astounding discovery that Hindustan possessed, in spite of the changes of realms and changes of time, a language, of unrivalled richness and variety, a language, the parent of all those dialects that Europe has fondly called classical — the source alike of Greek flexibility and Roman strength. A philosophy, compared with which, in point of age, the lessons of Pythagoras are but of yesterday, and in point of daring speculation Plato's boldest efforts were tame and commonplace. A poetry more purely intellectual than any of those of which we had before any conception; and systems of science whose antiquity baffled all power of astronomical calculation. This literature, with all its colossal proportions, which can scarcely be described without the semblance of bombast and exaggeration claimed of course a place for itself—it stood alone and it was able to stand alone ....To acquire the mastery of this language is almost the labour of life; its literature seems exhaustless. The utmost stretch of imagination can scarcely comprehend its boundless mythology. Its philosophy has touched upon every metaphysical difficulty.

W. C. Taylor.

There is hardly a modern science with which the Hindus were not acquainted in some form or other. With a flexible language like Sanskrit in their hands the thoughts of the great thinkers revealed the solutions of the subtlest problems of philosophy, of which there is scarcely a counterpart that they have left untouched. "Mathematical science was so perfect" says Captain Cunningham, "and astronomical observations so complete that the paths of the sun and the moon were accurately measured. The philosophy of the learned few was perhaps for the first time, firmly allied with the theology of the believing many, and Brahmanism laid down as articles of

faith the unity of God, the creation of the universe, the immortality of the soul and the responsibility of man. The remote dwellers upon the Ganges distinctly made known that future life about which Moses is silent or obscure, and the unity and omnipotence of the Creator which were unknown to the polytheism of the Greek and Roman multitude, and to the dualism of the Mithraic legislators, while Vyasa perhaps surpassed Plato in keeping the people tremblingly alive to the punishment which awaited evil deeds."

Even at the present day, when time has consigned the overwhelming majority of her literature to oblivion, the remnants of that superb intellectual edifice of ancient India cover such an extensive area that, as Sir William. Jones writes, "human life would not be sufficient to make one's self acquainted with any considerable part of Hindu literature." "The number of Sanskrit works," says Prof. Max Muller, "of which MSS are still in existence amount to ten thousand. This is more I believe, than the whole classical literature of Rome and Greece put together." Count Bjornstjerna writes, "The literature of India makes us acquainted with a great nation of past ages, which grasped every branch of knowledge and which will always occupy a distinguished place in the history of the world. No reasonable person will deny to the Hindus of the former times the praise of very extensive learning. The variety of subjects upon which they wrote prove that almost every science was cultivated among them ..... The more their philosophical works and law books are studied, the more will the enquirer be convinced of the depth of the wisdom possessed by the authors." Ward's *Antiquity of Hinduism.*

Even the religion and mythology of the ancient Indians have been acclaimed as a source of enlightenment. "Although," says

Prof. Max Muller, "there is hardly any department of learning which has not received new life and new light from the ancient literature of India, yet nowhere is the light that comes to us from India so important, novel, and so rich as in the study of religion and mythology." "The intellectual debt of Europe," says Prof. Macdonell, "to Sanskrit literature has been undeniably great. It may perhaps become greater still in the ages that are to come."

The language that presents us these hoarded treasures of the bygone days has attracted great attention of the Western scholars. Sir William Jones calls it "of a wonderful structure, more perfect than the Greek, more copious than the Latin, and more exquisitely refined than the either." "The Sanskrit," says Prof. Heeren, "We can safely assert to be one of the richest and most refined of any. It has moreover, reached a high degree of cultivation, and the richness of its philosophy is in no way inferior to its poetic beauties, as it presents us with abundance of technical terms to express the most abstract ideas." Fredrick Schlegel, the famous German Sanskritist, writes, "Justly it is called Sanskrit, i.e., perfect, finished..... The Sanskrit combines these various qualities, possessed separately by other tongues: Grecian copiousness, deeptoned Roman force, the divine afflatus characterising the Hebrew tongue... Judged by an organic standard of principal elements of language, Sanskrit excels in grammatical structure, and is indeed, the most perfectly developed of all idioms – not excepting Greek and Latin." Mons. Dubois, Mr. Bopp, Dr. Ballantyne, and other indisputable authorities believe Sanskrit to be the source of all the languages of the world, and Sir William Jones states, "I was not little surprised to find that out of ten words in Du Perron's *Zind Dictionary* six or seven were pure Sanskrit."

Pococke, while criticising Grote's *History of Greece*, in which the author paints the whole picture as mythical and refuses to unravel the mysteries of Greece into reality and remove the curtain of legend from upon the historical truths on the grounds that, "The curtain is the picture," and conceals nothing behind, and cannot by any ingenuity be withdrawn, writes, "To say that 'the curtain is the picture,' is fortunately for history, a mythical saying; and to affirm that 'the curtain contains nothing behind and cannot by any ingenuity be withdrawn' rests on the feeling which, thirty years since, would have classed the railway locomotive, and its glowing eye of night, with the eye of the Cyclops. The case may be stated as follows : – The PICTURE is INDIAN – the CURTAIN is GRECIAN; and the CURTAIN is now WITHDRAWN." Then he proceeds to illustrate one of the methods that he has adopted to prove that "these are just conclusions... not resulting from any vague system of etymological interpretation. There is one author, to whose valuable speculations, founded on a rare and well directed sagacity. I bear a willing testimony. The evidence through which I have gone, based upon authorities totally different from those of the learned writer, have yet produced an aggregate, amply conforming his conjectural conclusions. It is my object, however, to form the chain of evidence by which alone the rational mind can lay hold of truth; and in lieu of generalities and vague suggestions, to present such corroborative proof as will amount to historical fact. But before we take another step in this enquiry, it will be of advantage first to probe the extent of our own ignorance, then to apply a remedy. The former I shall endeavour to effect by a few plain propositions; the latter will be found in the process adopted throughout this work :–

POSTULATES

1. Let it be granted that the names given to mountains, rivers, and towns; have some meaning.

2. Let it be granted that the language of the Name-givers expressed that meaning.

3. Let it be granted that the language of the Name-givers will explain that meaning.

THEN,

The Greeks dwelt in a land called Greece.

1. They named mountains, rivers, towns; which names had a meaning.

2. Their language expresses that meaning.

3. Their language will explain that meaning.

If their language will not explain that meaning, then they, the Greeks, did not give those names, but some other nation, speaking some other language, and that other language will tell who that other nation was.

NOW,

The Names given are Geographical.

The Name-givers are Historical.

HENCE,

The geography and history of a country must be sought either in the language of the Name-givers of that country, or in a translation of the language of the Name-givers of that country.

Let us apply this to Grecian Geography.

As a Greek, let me translate Stympha,– I cannot. Dondona,– I cannot. Cambunii-Montes,– I cannot........ What then can I do? If it be said that certain of these people, or certain of these places were named from men, called Chaonus, Ithacus, Magnes, Thesprotus, Corinthus, Acarnan, Pharsalus, Bœotus, then, what is the meaning of these names?

Surely an Englishman can tell the meaning of Smith, Brown, Wood John's-son, Green, Black & c.; and though Good, Shepherd, Wiseman, Lamb may have no particle of the qualities which once gave these titles, the fact cannot be done away with, that the names are English, and they may be explained in English. A similar process will deal with foreign names found in this country– they must of course be sought for in a foreign language. We are then, ignorant, let us not deny it, of the simple meaning of the names of nearly every place in Greece; and yet we flatter ourselves that we are writing what we call Classical Geographies and Grecian Histories. But now mark the perilous position to which this admission will reduce us. If we, through either the vanity or ignorance of Greeks, are unacquainted with the original import of the Geographical nomenclature of Greece, then we are equally ignorant of the History of that period, if our Grecian informants have not, with historical facts, given us full value of historical names.

What I have now to show is, that they have given us those names; but as those names have no significance attached; they are historically, as the earliest map of Greece is geographically, worthless; nay more, they have led, and still lead us, astray. They have told us of Pelasgoi and Pelargoi,

and forthwith our literati expend their energies upon problems impossible of solution, with the feeble means at their disposal. They attempt to draw from the Greek language a language not in existence at the Pelasgian settlement of Hellas,– a history of the origin of the Pelasgians, – a process similar to an investigation of the origin of the Saxons, by the sole aid of the English language.

What then, having confessed our ignorance of men and things in the olden times of Greece, that is, in the time of the Pelasgian race, – what then is the remedy ? Simply to refer to the Pelasgian, instead of the Greek language, for solid information in lieu of fabulous commentary. Is that language still in existence ? It is. IT IS THE SANSKRIT, both pure, and in the Pali dialect: sometimes partaking of the form and substance of the Kashmirean, and very often of the structure and vocables of the old Persian. But what, it will be asked, is your proof of this? My proof is one of the most practical that can be imagined; a proof historical and geographical; establishing identity of nomenclature in the old and new country of the Greek settlers, and acquiring the power by this language of restoring to plain common-sense the absurdities of the whole circle of Greek literature, from Hesoid and the Logographers downwards. Of these ample evidence will be given as I proceed. These are large claims, but not inconsistent with the facts of the case."

The unprejudiced mind is at once led to the conclusion, before the monumental proofs of the precedence of the Sanskrit language to that of any other language of the world; and notwithstanding its high antiquity it is still justly claimed to be the most perfect and "the language of languages" as Prof. Max Muller calls it. It is a feat of the Hindus which has

not been matched by any other nation even in the heyday of science and reason. If they were the first to invent a language of unrivalled richness they were also the first to introduce the art of writing. Count Bjornstjerna says that the Hindus possessed written books on religion before 2800 B.C., 800 years before Abraham. Prof. Heeren says, "Everything occurs to establish the fact that alphabetical writing was known in India from the earliest times, and that its use was not confined to inscriptions, but extended also to every purpose of life" *Historical Researches* Vol. II.

Mr. Sarda quotes : a paper on *The use of Writing in Ancient India*, read by Mr. S. K. Varma, Oriental Lecturer, Balliol College, Oxford, before the international Congress of Orientalists at Leyden, proving the use of writing in the Vedic times in the face of all the arguments advanced to prove the comparatively later date of writing in India. The learned writer says: "I feel no hesitation in saying that there are words and phrases occurring in the samhitas of the Vedas, in the Brahmans and in the Sutra works, which leave no doubt as to the use of the written characters in ancient India. It may be confidently asserted that the systematic treatises in prose which abounded at and long before the time of Panini could never have been composed without the help of writing. We know for certain that with the exception of the hymns of the Rigveda, most of the Vaidic words are in prose, and it is difficult to understand how they could possibly have been composed without having recourse to some artificial means",

This language, unmatched for its flexibility, range, and perfection of construction defies comparison with any of the most improved of modern or ancient languages. Prof. McDonnell says: "We Europeans, 2500 years later, and in the

scientific age still employ an alphabet which is not only inadequate to represent all the sounds of our language, but even preserve the random order in which vowels and consonants are jumbled up as they were in the Greek adaptation of the primitive Semitic arrangement of 3000 years ago."

Prof. Wilson in his *Essays on Sanskrit Literature* writes : "It is well known how long it took before the Greeks arrived at a complete nomenclature for the Parts of Speech. Plato only knew of noun and verb as the two component parts of speech, and for philosophical purposes, Aristotle too, did not go beyond that number. It is only in discussing the rules of rhetoric that he is led to the admission of two more parts of speech - conjunctions and articles. The pronoun does not come in before Zonodotus and the preposition occurs first in the Aristarchis. In the *Pratishakhya* on the contrary, we meet at once with the following exhaustive classification of the parts of speech..." "The idea of reducing a whole language to a small number of roots, which in Europe was not attempted before the sixteenth century by Henry Estienne, was perfectly familiar to the Brahmans at least 500 years before Christ." - Max Muller.

Professor Weber says, "We pass at once into the magnificent edifice which bears the name of Panini as its architect, and which justly commands the wonder and admiration of everyone who enters, and which, by the very fact of its sufficing for all the phenomena which language presents, bespeaks at once the marvellous ingenuity of its inventor and his profound penetration of the entire material of the language." "The grammar of Panini," says Sir Monier Williams, "is one of the most remarkable literary works the

world has ever seen, and no other country can produce any grammatical system at all comparable to it either for originality of plan or analytical subtlety."

The poetry of the Hindus still stands unrivalled. If the language at the disposal of the ancients was artistic and perfect beyond comparison their own subtle genius was no less productive of all that was best and well worthy of "the language of language" in their divine expression. There was no branch of science or literature where poetry did not find its way; as Count Bjornstjerna says, "It has lent its forms, its colouring, its charms even to the most abstract of sciences, yea, even to religion." Prof. Heeren says: "The various branches of poetry, such as the narrative and the lyric as well as the didactic and the apologue have all flourished in Sanskrit literature, and produced the most excellent results."

In spite of the highest standard that the poets had to keep in order to be popular and appreciated, the quantity of the work of Hindu writers is amazingly great in its bulk. Mahabharata is many times the bulk of Iliad and Odyssey put together. Sir Monier Williams says: "Although the Hindus, like the Greeks, have only two great epics, namely, the Ramayana and the Mahabharata, yet to compare these with the Iliad or the Odyssey is to compare the Indus and the Ganges rising in the snows of the world's most colossal ranges, swollen by numerous tributaries spreading into vast shallows or branching into deep divergent channels, with the streams of Attica, or the mountainous torrents of Thessaly. There is in fact, an immensity of bulk about this, as about every other department of Sanskrit literature, which, to Europeans accustomed to a more limited horizon, is absolutely bewildering." "Well may the Ramayana challenge

the literature of every age and country," says Griffith, "to produce a poem that can boast of such perfect characters as a Rama and a Sita...... Nowhere else poetry and morality are so charmingly united, each elevating the other as in this really holy poem." Vyasa, the reputed author of the Mahabharata," writes Saint Hillaire Bartholomy, "appeared greater even than Homer, and it required a very little indeed, to place India, above Greece."

In drama and lyric poetry, too, the Hindus had attained a proficiency of a very high order. The laws of rhetoric propounded by them thousands of years ago, still stand unsurpassed for their perfection and finish. The Sanskrit drama exhibits a much finer taste and is more developed in form than the Greek and Latin work in this branch. It is far less sensual. The Greeks were quite unacquainted with the division of the play into acts, an essential feature of the Hindus drama, which is, in addition more artistic and still more moral. Prof. Wilson writes: "We may, however, observe to the honour of the Hindu drama, that *Parakiya,* or she who is the wife of another person, is never to be made the object of a dramatic intrigue: a prohibition that would have sadly cooled the imagination and curbed the wit of Dryden and Congreve." "And we must," says Prof. Heeren, "in truth, allow Kalidasa to be one of those poets who have done honour not merely to their nation but to all civilised mankind." Macdonell shows that the prelude of *Sankuntala* suggested to Goethe the plan of the prologue on the stage in *Faust* and Schiller borrowed the idea from *Meghaduta* in his *Maria Stuart* where Mary "calls on the clouds as they fly southwards to greet the land of her youth." Fauche rightly

observes, "The *Megha Duta* is without a rival in the whole elegiac literature of Europe."

India was the first country to invent folklore, and all the fables of Europe have been traced to India as their source by Elphinstone, Colebrook, Baron de Sacy and Professor Wilson. About the translation of the *Panchatantra*, Prof. Macdonell writes "The Arabic version is of great importance as the source of other versions which exercised very great influence in Europe. These versions of it were the later Syriac (C 1000 A.D.), the Greek (1180), Persian (C 1130), recast later (C 1494) under the title of *Anwar-e-Suhaili* or Lights of Canopas, the old Spanish (1251) and the Hebrew one made about 1250 A.D."

No nation can vie with the Hindus for their daring speculation and critical faculty in the realm of philosophy. They had the widest range of thought of which the man is capable, and from which resulted the sublimest and the most comprehensive philosophy covering all possible solutions of the mysteries regarding the nature of Man and Universe. Fredrick Schelgel expresses himself thus on Indian philosophy, "The divine origin of man as taught by the Vedanta, is continually inculcated, to stimulate his efforts to return, to animate him in the struggle, and incite him to consider a reunion and reincorporation with Divinity as one primary object of every action and reaction. Even the loftiest philosophy of the Europeans, the idealism of reason as set forth by the Greek philosophers, appears, in comparison with the abundant light and vigour of oriental idealism like a feeble Promethean spark in the full flood of the heavenly glory of the noonday sun, faltering and feeble, ever ready to be extinguished." Discussing the difficult problems of mind,

matter and soul, Sir William Hunter says, "Brahman philosophy *exhausted the possible solutions* of these difficulties and of the other great problems which have since perplexed Greeks, Romans, Medieval schoolmen and modern men of science." Dr. Enfield in his *History of Philosophy* shows that Pythagoras, Anaxarches, Pyrrho, and others visited India for the purpose of acquiring knowledge, who afterwards became eminent philosophers in Greece."

Count Bjornstjerna, Schlegel, Mr. Princep, Rev. Ward, Professors Macdonell and Wilson believe it according to Greek tradition as well as to the course of evidence that Thales, Empedocles, Anaxagoras, Democritus, and Pythagoras *really* visited India in order to study philosophy.

There were six schools of Indian philosophy, excluding the *Charwakas* or the Nihilists, comprehending all the possible aspects capable of being presented by the high soaring flights of human genius, and no counterpart of any system of European philosophy would be found missing in them, on the other hand, after all these centuries the philosophers of Europe may only show some retrograde step taken by them in the race of intellect, as is also supported by John Davies in *Hindu Philosophy*, who, commenting upon the Sankhya system of Hindu Philosophy calls it 'the earliest attempt on record to give an answer, from reason alone, to the mysterious questions which arise in every thoughtful mind about the world, the nature and relations of man and his future destiny." Referring to the German philosophy of Schopenhauer and Hartmann, he says, "It is a reproduction of the philosophic system of Kapila in its materialistic part..... but on the same fundamental lines. In this respect the human intellect has gone over the same ground that it occupied more

than two thousand years ago; but on a more important question it has taken a step in retreat. Kapila recognised fully the existence of soul in man, forming indeed his proper nature – the absolute of Fichte – distinct from matter and immortal, but our latest philosophy both here and in Germany, can see in man only a highly developed organism."

Sir Monier Williams in his *Brahmanism and Hinduism* writes, "Indeed if I may be allowed the anachronism, the Hindus were Spinozites thousands of years before the birth of Spinoza, Darwinians centuries before Darwin, and evolutionists many centuries before the doctrine of evolution had been expected by scientists of our time, and before any word like 'evolution' existed in any language of the world." "The views of the modern psychologists," says Sir William Hunter, "are a return with new light to the evolution theory of Kapila." "Oh! how thoroughly is the mind here washed clean?" says Schopenhauer, "of all early engrafted Jewish superstitions and of all philosophy that cringes before those superstitions. In the whole world there is no study, except that of the originals, so beneficial and so elevating as that of the Upanishads. It has been the solace of my life, it will be the solace of my death."

The science of Mathematics, too, saw a high development in the hands of the Hindus. They were the inventors of the decimal system, and zero, without which the arithmetic would be reduced to nonentity. "They attained a very high proficiency in arithmetic and algebra." says Sir William Hunter, "independent of any foreign influence." Prof. Wallace writes, "However ancient a book may be in which a system of trigonometry occurs, we may be assured it was not written in the infancy of the science. Geometry must have been known

in India long before the writing of the *Surya Siddhanta*... *Surya Siddhanta* contains a rational system of trigonometry, which differs entirely from the first known in Greece and Arabia. In fact it is founded on a geometrical theorem, which was not known to the geometricians of Europe before the time of Vieta, about two hundred years ago. And it employs the sines of arcs, a thing unknown to the Greeks, who used the chords of double arcs. The invention of sines has been attributed to the Arabs, but it is possible that they may have received this improvement in trigonometry as well as the numerical characters from India... In expressing the radius of a circle in parts of the circumference, the Hindus are quite singular. Their rule for the computation of the lines is a considerable refinement in science first practised by the mathematician Briggs.... Before an author could think of embodying a treatise in the heart of a system of astronomy, and turning the researches of the one science to the purposes of the other, both must have been in a state of advancement as the lapse of several ages and many repeated efforts of inventors were required to produce." "This is unanswerable evidence," says Professor Wilson, "in the favour of the antiquity, originality, and advance of the Hindu mathematical science." "To the Hindus," says Sir Monier Williams, "is due the invention of algebra and geometry and their application to astronomy." Astronomy reached its climax in the hands of the Ancients. Count Bjornstjerna on the authority of Bailly, informs as "that Laubere, who was sent by Louis XIV as ambassador to the Kind of Siam, brought home in year 1687, astronomical tables of solar eclipses, and that other similar tables were sent to Europe by Patouillet and by Gentil, which later were obtained from the Brahmins in Tirvalore, and that they all perfectly agree in the calculations although received

from different persons, at different time, and from places in India remote from each other. On these tables, Bailly makes the following observations. The motion calculated by the Brahmins during the long space of 4383 years (the period elapsed between these calculations and Bailly's), varies not a single minute from the tables of Cassini and Meyer; and as the tables brought to Europe by Laubere in 1687, under Louis XIV, are the older than those of Cassini and Meyer, the accordance between them must be the result of mutual and exact astronomical observations.... If it be true that the Hindus more than 3000 B.C., according to Bailly's calculations, had attained so high a degree of astronomical and geometrical learning, how many centuries earlier must the commencement of their culture have been, since the human mind advances only step by step in the path of science.... Parasara had read in the divine book of heavenly firmament long before the Chaldeans, the Arabs and the Greeks." Tilak, in his highly erudite treatise, the *Orion*, has conclusively proved the indebtedness of the Greek astronomers to the Hindus.

The theory of gravity was known long before the birth of Christ. *Siddhanta Shiromani* describes it in the following verse: -

आकृष्टशक्तिश्च मही तया यत् स्वस्थ

गुरु स्वाभिमुख स्वशक्त्या ।

आकृष्यते तत्पततीव भाति ....

"The earth, owing to its force of gravity, draws all things towards itself, and so they seem to fall towards the earth..." (Sarda)

The progress of the Hindus in the field of medicine is highly praiseworthy. Prof. Wilson says, "The ancient Hindus obtained as thorough a proficiency in medicine and surgery as any people whose acquisitions are recorded. This might be expected, because their patient attention and natural shrewdness would render them excellent observers. While the extent and fertility of their native country would furnish them with many valuable drugs and medicaments. Their diagnosis is said, in consequence, to define and distinguish symptoms with great accuracy, and their materia medica is most voluminous."

Thus we find that there was hardly a branch of science that was not moulded into perfection by the divine touch of Hindu genius. In art and architecture, steel and iron manufactures, in the arts of war and peace, in painting, drawing, weaving, and dying, in fact all the attainments that the human mind can bring within the bounds of earthly reality were mastered by the ancient Hindus. They were the first to sow the seed of civilisation in the soil of barbarism, and built up a religion whose very superstitions are scientific and enlightening, a religion which gave birth to all the subsequent religions of the world. To Hindus is due the invention of the greatest and most perfect language of all time, that cannot be challenged for its flexibility, copiousness, range, deep tone and the ring of sweetness by any foreign production. They were the first nation to introduce the art of writing, and their proficiency in grammar has been exclusive and unrivalled. They produced the greatest masterpieces of dramatic and lyric art, and there scarcely is any branch of literature that the pen of the ancient Hindus has not glorified. They were the first to tackle with the most subtle problems of nature and universe,

and their speculations in philosophy seem to have left no ground for improvement, as indeed, they still defy comparison with best productions of modern philosophers. It was the Hindus who worked out for the first time the problems of arithmetic, geometry, and algebra, and their application to science of astronomy, which saw its climax in the hands of the Hindus. They were the first to propound the theory of evolution, theory of gravity, first to discover the laws of differential calculus and trigonometry and first to understand and describe mensuration in their books. They invented the science of medicine, they first dissected the human body for surgical knowledge, which was entirely unknown to the Hippocratic school, and were the first to open hospitals and charitable dispensaries for the suffering. They founded, amongst numerous others, the science of chemistry, and introduced the use of chemicals in medicine for the first time, and in fact, it would be difficult to find out a useful science even today which was not carried to perfection in the Golden Age of India, which through the incessant stream of misfortunes upon her, has left only the wealth of idle dreams of the Past as her legacy.

CHAPTER III

THE FIRST MEDICAL SYSTEM OF THE WORLD

In consideration of the outstanding independent achievements of the Indians in most branches of sciences and art, and of their aversion to foreign influences, the trend of opinion today, informed by recent discoveries is in favour of the originality of Indian medicine in its most salient features.

Neuberger.

It was only too natural for the ancient Hindus to bring forth a highly developed system of medicine consistent with their other scientific achievements. Medicine differs materially from and has a great advantage of developments. Medicine differs materially from and has a great advantage of development over other branches of knowledge like philosophy, algebra, trigonometry, astronomy and the like. It would require, for instance, a calm and an age-long period of an established standard of civilisation, ripe enough in intellect to be capable of the appreciation of the dry problems and subtle intricacies of the science in order to attract the general attention towards Trigonometry or Astronomy, and an equally long and independent development of both would be required before the principles of one be applied to the purposes of the other. But such is not the case with Medicine, for unlike other sciences, it is developed from a desire from within, and not from any foreign impetus. Ailment is the inseparable companion of life, and with ailment springs simultaneously the desire which soon turns into the Effort to Heal, and it is

this effort, whether primitive or advanced that has gone by the name of Medicine in every country.

It is therefore clear that the science of medicine does not require to wait for a very learned atmosphere to spring into existence and though it might require a Kapila or a Gautama to create the Sankhya or Nyaya philosophy the origin of Medicine cannot be traced to one man, unless it be the Great Brahma himself who is said to have composed Ayurveda, the system of Hindu Medicine, in a hundred thousand verses divided into a thousand chapters, even before the creation of the animated beings,

इह खल्वायुर्वेदो नाम ...... अनुत्पाद्यैव प्रजाः श्लोकशत-

सहस्त्रमध्यायसहस्त्रञ्च कृतवान् स्वयम्भूः ।

Sushruta, Sutrasthan.

Another tradition believes Ayurveda to be of divine origin, and that it was only revealed to Brahma at the time of the Creation. Medicine is also dealt with on a large scale in the Vedas in the form of hymns to various plants potent in the cures of various diseases. This was a science, therefore, that could not be ignored by the ancients who were pioneers even in the most far-fetched theories having very little to do with the daily life of man. It is now only a simple question of common-sense to understand the extent to which they must have developed this science, which was a daily necessity, when they had attained unsurpassed success in other fields of purely intellectual achievement. It is in medicine, in fact, that India has rendered greater benefit to the world than in any other branch of learning. Here again we find the lamentable reluctance of the Western scholars, with a few learned

exceptions, to admit the superiority of India over the immediate instructors of the west – the Greeks. "It is curious to reflect," says Dr. Ray, "that the upholders of the 'Greek culture' are often found ready though unconsciously to twist and torture facts and conclusions to serve their own purpose, and reserve to themselves the benefit of doubt as regards dates; but whenever the priority of the Hindus is unquestionable, an appeal is made to the theory of common origin and independent parallelism of growth. These scholars seems to smart under a sense of injury if they have to confess that Europe owes an intellectual debt to India, hence many a futile attempt to explain away positive historical facts." We may take a hasty glance of the evidence that points out India to be the originator of the first system of medicine.

INDIAN AND GREEK MEDICINE

It has been shown in the previous chapters that there are stable proofs to show that ancient Greece was no more than a settlement of some immigrants from India. That much of their philosophy and religion owes its origin to India has been likewise demonstrated. This fact goes much to support the probability of the Indian origin of medicine, if, as Sir P.C. Ray says, the capacity of a nation is to be judged by what it has independently achieved in the several fields of knowledge and branches of literature. The visit of Pythagoras, Ktesias, and other Greek physicians and philosophers to India again goes to prove it as the centre of learning in the ancient times. Again, Max Muller tells us that 'a Brahman named Kalanas (Kalyana) was tempted by the promises and flattery of Alexander and travelled as far as Greece where he burnt himself repenting for his submission to a foreign emperor.'

Alexander kept in his court Indian physicians to treat his army in case of accident and disease.

It is difficult to believe in the independent development of Indian and Greek medicine in the face of the fact that there was a constant intercourse between the two countries from a very early period. Dr. Hoernle writes, "Probably it will come as a surprise to many, as it did to myself, to discover the amount of anatomical knowledge which is disclosed in the works of the earliest medical writers of India. Its extent and accuracy are surprising when we allow for their early age-probably the sixth century before Christ– and their peculiar methods of definition. In these circumstances the interesting question of the relation of the medicine of Indians to that of the Greeks cannot well be denied, when we know as an historical fact that two Greek physicians, Ktesias about 400 B.C., and Megasthenes about 300 B.C., visited, or resided in, Northern India."

The daring statement of Haas that Hindu Medicine took place between the tenth and the sixteenth Centuries A.D., and that Sushruta and Kashi are corrupted forms of Hippocrates and Cos, could be left out unobserved for its pure and unmixed absurdity "which," says Ray, "Hoernle curtly disposes of as 'an elaborate joke,' were it not for the fact that the German critic represents a school which cannot or will not see anything in India, which can claim originality or antiquity." In his blind zeal to keep back the claims of India he argues that the connection between Hippocrates and Cos gave rise to the idea that Sushruta wrote the famous work from Kasi, ignoring the fact that Kasi flourished long before the birth of Hippocrates in Greece, and his subsequent relations with the city of Cos. Buddha (500 B.C.) preached

his religion at Kasi, and even if we suppose that Hippocrates flourished the very day he was born, the preaching of Buddha at Kasi, is an undeniable historical fact preceding Hippocrates' birth by about half a century. But to be more reasonable we are to assume that though Hippocrates was born in 450 B.C. he must have taken at least half a century to flourish so much as to effect an adaptation in the appellation of a far off Indian city through the influence of his personality. According to this theory the name of Kasi should be foreign to the annals of Indian history before 400 B.C., a statement devoid of reason and evidence alike.

Sushruta, again, is older than Hippocrates himself by more than a century at least. As will be shown Atreya flourished in the early sixth century, and though there are reasons to believe that this was some other Atreya than Punarvasu, this is the latest date that can be assigned to him, and therefore the safest. Sushruta refers to the system of Atreya in his book and points out the differences clearly. This places Sushruta in a period later than the sixth century before Christ. On the other hand "there are indications," says Hoernle, "in the *Satapatha Brahmana*, a secondary Vedic work, that the author of it was acquainted with the doctrines of Sushruta. The exact date of this work is not known, but it is with good reason referred to the sixth century B.C."

One of Haas' most glaring blunders is his curious assertion that the *Charaka* and the *Sushruta* have been elaborated from the originals of Vagbhata, Madhava, and Sarangdhara, forgetting that the latter are full of repeated and grateful references to the former as the great and revered authorities on which they have based their treatises.

The striking resemblance between the *Tridosha* of the Indians and the Humoral theory of the Greeks has been relied on a good deal to support the theory of the indebtedness of one nation to the other. In view of the undisputed priority of the Hindus it is the Greeks who are likely to be the borrowers of their ideas from the Indians.

Whatever the validity of the claim of this likeness between these two theories, this was another field for Dr. Haas to jump in with his fallacy of the Greek influence over Indian medicine. That absurdity reached its climax in the fostering care of this school of critics would be clear from a similar statement of Dugald Stewart, who considers that not only is the Sanskrit literature an outcome of the Greek one, but Sanskrit itself is a forgery made by the crafty Brahmans on the model of Greek after Alexander's conquest![1]

Haas very conveniently forgets that not only the Indian Triḍosha theory is entirely different from, and far more scientific than the Greek theory of the four humours (the numbers three and four of the Indian and Greek conception of humours constitute in themselves a cardinal difference), but the mention of the *doshas* is made as early as the Rig Veda scripture, many centuries before Greece began to dream of any such thing as literature :

त्रिधातु शर्म वहतं शुभस्पति Rig. I. 35. 5.

त्रिधातु शर्म is here explained by Sayana as त्रिधातु वातपित्तश्लेष्मशमनविषयं शर्म सुखं *i.e.*, the comfort resulting from the suppression of the deranged *Vata*, *Pitta*, and *Shleshma*.

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[1] History of Sanskrit Literature by Macdonell.

The mention of the doshas in the Vedic literature leaves no grounds for Haas' bold assertion, though nothing better can be expected from a man who finds in the work of Madhava, who flourished somewhere in the sixth or seventh century A.D., the germ of the work of Sushruta (600 B.C.).

Hoernle states on the authority of Rockhill (*Life of Buddha*), that the famous physician Jivaka, a contemporary of Buddha studied medicine at the Taxila university under Atreya, who in the time of Buddha or shortly before it, was the leading professor of medicine amongst the 'professors of world-wide renown' (*disa pamokkha acariya or disa-pramukkya-acharya).* Even if this period were to be accepted as one during which Atreya of *Charaka Samhita* flourished (for there is evidence tending to place Atreya much earlier, and another difficulty is raised when we find that the name Punarvasu is not mentioned anywhere with the teacher of Jivaka; Atreya of the 6th Century B.C. Also there are more than one Atreya in Ayurvedic medical literature, (e.g. Krishnatreya, Punarvasu Atreya. Datta Atreya, etc.), we may be sure of the fact that even before the birth of Hippocrates, fondly called the Father of Medicine, the system of Indian Medicine had reached its climax and all the Ayurvedic treatises written after Sushruta and Charaka, have been modelled out of the vast treasures of these two originals, which still lie unexplored to a considerable extent.

Another remarkable difference is that the Hippocratic school is totally ignorant of human dissection, which has been enjoined by Sushruta as the most important and the only means through which the accurate anatomical knowledge can be acquired. Sushruta describes in marvellous details the method of preparing a corpse for surgical examination and condemns the surgeon who fails to gain direct knowledge in this way.

The identification of certain drugs of Indian origin in Greek medicine is another important proof of the influence of Indian medicine on that of the Greeks. "Hippocrates the Great," writes Dr. Mukerji, "who was contemporary and kinsman of Ktesias, the court physician to the King of Persia, mentions :– Sesamum Indicum (*Tila)*; Nardostachys Jatamansi (*Jatamansi*); Beswillia Thurifera (*Kunduru*); Zinziber Officinale (*Shringavera*); and Piper Nigerum (*Marici*)."

Weber in his *History of Indian Literature* remarks that "there is no ground whatsoever to suppose that Sushruta borrowed his system of medicine from the Greeks, on the contrary there is much to tell against the idea."

Dr. David C. Muthu writes, "The elemental theory of the Hindus and their physiological theory that the same principles which sustain life and the organism are transformed into dynamics of diseases were echoed by Hippocrates many centuries after ... Even by the earliest of the Greek writers Indians drugs are mentioned by corrupted Sanskrit names. Many medicines produced in India were used by the early Greek physicians, whereas Indian medical treatises do not contain a single technical term which points to a foreign origin."

It cannot therefore be contested that the system of Hindu Medicine developed independent of any foreign influence; on the other hand, the historical connections between the ancient Hindus and Greeks, the constant visits of the Greek philosophers and physicians to the centres of learning in India, such as Pythagoras, Ktesias, and Megasthenes, along with certain undeniable similitudes between the two systems,

too numerous to be explained away as chance-coincidences, support the fact that in this case also as in others, the Greeks were 'the learners and not the teachers.' Hoernle remarks, "Considering that we have no direct evidence of the practice of human dissection in the Hippocratic School, but know of the visit about 400 B.C. of Ktesias to India, the alternate conclusion of the dependence of Greek anatomy on that of India cannot be simply put aside."

Dr. Mukerji writes in the *Surgical Instruments of the Hindus*, "All these coincidences can scarcely be accidental; and though we may not be able to trace the actual progress of Medicine from India to Greece, yet the evidence in favour of its transmission is too strong to be held in doubt."

AYURVEDA AND THE ARABIC MEDICINE

The medicine of the Arabs deserves special mention as it is an important medium through which the Hindu medicine travelled to Europe. "The Arabians," says Sir P.C. Ray, "are acknowledged to have played a prominent part in the propagation of science and mathematics in the West. When in the dark and middle ages, the lamp of knowledge had begun to burn very low in Europe and even when the very vestiges of Greek culture and learning had but disappeared, save in the obscure dingy cells of the monks, it was the Arabs who carried there the accumulated intellectual treasures of the East, and thus laid the foundation, so to speak of modern European greatness...

"The author of *Kitab-al-Fihrist*, who wrote towards the middle of the tenth century[1], distinctly mentions that by order

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[1] "Abu'l Faraj Mohammed bin Ishak, surnamed au-Nad:m a native of Baghdad, first conceived the idea of a bibliographical dictionary. His

of the Caliphs Harun and Mansur, standard Hindu works on medicine, materia medica, and therapeutics were translated into Arabic. The information on the subject has been gathered at length by Dietz in his *Analecta Medica*, and Wustenfeld, author of *Geschichte der* Arab. Aerzte, Cureton, Flugel, Muller and other Arabic writers." Prof. Wilson in a note appended to a paper by Rev. W. Cureton entitled *"A collection of such passages relative to India as may occur in Arabic writers"* writers, "In medicine the evidence is more positive, and it is clear that the *Charaka*, the *Sushruta*, the treatise called *Nidana* on diagnosis, and others on poisons, diseases of women and therapeutics, all familiar to Hindu science were translated and studied by the Arabs in the day of Harun and Mansur, either from the originals or translations, made at a still earlier period, into the language of Persia." (Journal of the Royal Asiatic Society, old Series vi pp 105-115).

Royle in his *"Antiquity of Hindu Medicine,"* writes, "We have positive testimony on the subject, as the Baron de Sacy, in his account of the well-known Sanskrit origin of the *Fables of Piplay*, states that they were first translated in Pahlevi during the reign of the Persian King Nooshirvan, who ascended the throne in 531 A.D. and died in 579 A.D. and who is reported by historians to have encouraged learning and to have introduced Grecian philosophy at his court. The translations were made by the physician Barzouyeh who had ***brought the original from India*** with other books, and who

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Kitab-al-Fihrist deals with every branch of learning. It gives the names of many authors and their works which have ceased to exist." - *History of the Saracens* by Ameer Ali P. 469.

by more than one previous journey to that country had acquired a knowledge of Sanskrit. He is stated particularly to have made two journeys, one for the purpose of procuring medicaments and herbs, and other for obtaining specimens of the literature of the Hindus ... Pervious even to this (AÖ D. 330), we hear of the Persian King Behram, visiting in disguise the court of Basdeo, sovereign of Canouge, to study the laws, religion and manners of the Hindus."

"Flugel states on the authority of the *Kitab-al-Fihrist,*" writes Dr. Ray, "That Susrud *(Sushruta)* was translated by Mankh, the Indian who cured Harun-ar-Raschid of a severe illness, and was appointed Physician-in-Charge of the Royal Hospital... We have ample and overwhelming testimony of Arabic writers, notably of Haji Khalifa, that Hindu astronomy, algebra, and medicine were zealously studied by their compatriots, and many Hindu servants were induced to reside at the courts of the Caliphs as their instructors Mussalman students in their eager thirst for knowledge used to flock to the centres of learning in India and there drank deep at the very fountain-head. Indeed it had come to be regarded as an essential part of completing one's liberal education to travel to India and learn the sciences first hand."

The name of Charaka, the well known Hindu physician occurs in the Latin translations of Avicenna (Ibn Sina), Rhazes (Al Rasi), and Serapin (Ibn Serapi).

Charaka was in the collection of Alberuni as shown by his learned translator and editor, Prof. Sachau. To quote his own words : –

"What India has contributed reached Baghdad by two different roads. Part has come directly in translations from

Sanskrit, part has travelled through Iran, having originally been translated from Sanskrit (Pali? Prakrit?) into Persian, and further from Persian into Arabic..."

"Another influx of Hindu learning took place under Harun, A.D. 786–808. The ministerial family Burmak, then at the zenith of their power had come with the ruling dynasty from Balkh, where an ancestor of theirs had been an official in the Buddhistic temple Naubehar *i.e. Navavihara,* the new temple (monastery). The name Burmak is said to be of Indian descent, meaning *parmaka*, i.e. the Superior (abott of *Vihara?*). Of course the Burmak family had been converted, but their contemporaries never thought much of their profession of Islam, nor regarded it as genuine. Induced probably by family traditions ***they sent scholars to India there to study medicine and pharmacology.*** Besides, they engaged Hindu scholars to come to Baghdad, made them the chief physicians of their hospitals, and ordered them to translate from Sanskrit into Arabic, books on medicine, pharmacology, toxicology, philosophy, astrology, and other subjects. Still in later centuries Muslim scholars sometimes travelled for the same purposes as the emissaries of Burmak, e.g. Almuwaffak, not long after Alberuni's time."[1]

The evidence adduced in favour of the indebtedness of the Greeks and Arabs to the Hindus in the science of medicine may also serve to prove that the system of Ayurveda stands unrivalled in its antiquity. The presence of the Ayurvedic principles in the hymns of the Vedas, the earliest records of human intellect, establishes for good the high antiquity and the originality of Hindu Medicine.

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[1] Hindu chemistry–Dr. Ray.

CHAPTER IV

THE ARTS AND SCIENCE OF THE HINDUS

"Indian medicine dealt with the whole area of the science. It describes the structure of the body, its organs, ligaments, muscles, vessels and tissues. The Materia Medica of the Hindus embraces a vast collection of drugs belonging to the mineral, vegetable and animal kingdoms, many of which have now been adopted by European physicians. Their pharmacy contained ingenious processes of preparation, with elaborate directions for the administration and classification of medicines. Much attention was devoted to hygiene, regimen of the body and diet."

Sir William Hunter.

It is a considerable area of therapeutics, materia medica, surgery, physiology and anatomy that Ayurveda covers. There is hardly a spot that may even faintly suggest a gap in the entire field of observation of the Hindu physicians. It would indeed be difficult to point out the absence of successful substitutes in the system of Ayurvedic medicine for even some of the best achievements of the Western doctors, not to speak of a host of easy and speedy cures that it prescribes where the West is still busy with experiments. This feature of Ayurveda, (unaccounted for cures as they say.)[1] has often led to such allegations as 'unscientific,' and 'empirical' against the system; for it has been contended that most of the practitioners of the indigenous system possess no information of the scientific value of the drugs they use, and their subsequent effects upon the physiological functions of

1 Hindu chemistry-Dr. Ray.

the organism, but often succeed in curing the patients through sheer empirical methods. This is a very unfortunate misconception and has no support in its favour except some apparently inexplicable cures at the hands of some insignificant practitioners of the indigenous system. It has, however been doubted if it is a genuine misconception at all and not one of the series of considerate attempts that have been made time and again to crush the indigenous system out of existence, as its efficacy, popularity, and cheapness, are a great check to the business of the Western countries, which are draining to the dregs the resources of the starving millions by an enormous sweep of Rs. 20,000,000 a year in the branch of medicine only. This is quite a formidable sum for a country like India dwindling under the scourge of the direst penury.

Whatever the inconsistencies of Ayurveda, it cannot be denied that the system, through all the vicissitudes of time, has stood alone entirely by virtue of its own intrinsic value and stable scientific foundations. The lamentable fact, however, must be confessed that much quackery has crept into the practice due to lack of state recognition; but it does not in any way prove that the Western medicine is entirely free from quacks and charlatans. How many compounders are prescribing allopathic preparations today without the least knowledge of their composition ? Yet they sometimes attract more patients than qualified doctors. It is curious that the supporters of Western medicine should shut their eyes to defects, not at all less conspicuous in their own system, and ascribe them exclusively to others. Another such misunderstanding on the part of the censors of Ayurveda is to find a similarity between the Tridosha theory and the Humoral theory of the Greeks. It would be conclusively

shown in the next chapter that the two theories are substantially different. While the letter is a misconceived adaptation of the former, the former, if carefully studied and analysed, presents a highly scientific basis of great practical value. Less advanced students of Ayurveda (like all other subjects) should not be supposed to represent the standard of Ayurvedic knowledge, if they fail to dress the elements of the theory in a scientific and comprehensible language. The formula of Vata, Pitta, and Kapha has been adduced for them by the more learned community and they have to apply it in order to obtain results without worrying with the whole problem. In fact, the truths arrived at by the experiments of the ancient savants of Ayurveda have been so unshakeable that even the junior practitioner does not fail in his practice generally. Nor is the ignorance or want of knowledge the only reason to explain away the inability of certain junior practitioners of Ayurveda to express the cause of successful treatment in "scientific" words, for their explanation may be quite scientific but may not be accepted as such in as much as they do not express themselves in the technique of the Western medicine, which has no monopoly to be exclusively scientific. Similarly, a student of Ayurveda should not condemn a compounder or a doctor for not being able to explain a particular point of allopathy in the terms of Ayurveda.

A very interesting difference between the Eastern and Western medical books is that whereas the former attach equal importance to diagnosis and treatment of a disease the latter, after imposing descriptions of the history of development, microscopic examination, causes, and

symptoms, etc. of a disease, suddenly collapse into a few lines in the description of the treatment. The rough and simple remedies prove often more efficacious than the refined and the sparkling products of the 'qualified' doctor's laboratory. How much do we hear of the new inventions and discoveries of the West, but in the domain of practice it is always the Ayurvedic physician who carries the palm and shows more venerable clinical results. The inventions of the West, no doubt, are very useful things, but sometimes they actually mislead the doctor. Thermometer, for instance, if applied in a chronic fever which according to Ayurvedic theory, has resulted from derangement of kapha would surely mislead the physician, for if this derangement of Kapha has not allowed the temperature to rise above the normal due to its highly cooling properties, while the fever is raging, the thermometer will indicate the normal, and the patient will be supposed to be healthy. Patients have passed away mysteriously at this apparently normal temperature while actually suffering from fever. Thermometer, in such cases, has only served to mislead the physician from taking any necessary step that he would have otherwise done.

Surgery had a brilliant past in India. Though there is hardly a practitioner of Ayurvedic surgery today in its ancient form, it is extensively practised by the Western physicians as borrowed directly by themselves or through the medium of the Arabic physicians. In ancient times it formed an important supplement to medicine in the art of healing, and still occupies an integral portion of one of the two greatest authorities on Ayurveda – the Sushruta Samhita. It would not be out of place here to briefly review the surgery of Ayurveda as it existed in the Ayurvedic period : –

Surgery was practised in India as early as the Rig Vedic period, where we find hymns addressed to Aswins, the surgeon-gods. The development at that early period was so dexterous that legs were amputated and injured eyes were plucked out.[1] Drs. Keith and Macdonnell say, "Wonderful cures are referred to as performed by the Aswins, the healing of the lame and of the blind, the rejuvenation of the aged Chyavana and Purandhi's husband, the giving of an iron leg to Vispala was a deed only more wonderful if we assume that Vispala was a mare, as has been suggested by Pischel." (Vedic Index Vol. II. Page 105). There being constant fights between the Aryans and other tribes, accidents were bound to happen. It was at these junctures that surgeons (*Shalya vaidyas*) were required to attend upon the Aryan chiefs, when broken limbs were amputated, fractures set, and pieces of broken arrow-shafts extracted, and even cranial operations performed with success. Sushruta describes 125 kinds of surgical instruments, and lays down directions to prepare new ones according to the exigencies of each case. The instruments include scalpels, lancets, needles, trocars, catheters, rectal and vaginal speculums and various other instruments of which the modern surgical instruments are but slight modifications. Sushruta's work is the first to lay stress on the accurate knowledge of anatomy as a necessary guide for the successful practice of surgery. He lays down rules for preparing a dead body for dissection in no dubious language, and emphasises the necessity of carefully observing and

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[1] सद्यो जंघामायसीं विश्पलायै धने हितासर्तवे प्रत्यधत्त ।

तस्मा अक्षीना सत्याविचक्ष आधत्त दस्राभिषजाथर्व्वान् ।।

Rik. Sam. 1. A, 8Ad. 186.

making sure of the various parts of the organism before starting the practice of surgery. "A dead body selected for this purpose should not be wanting in any of its parts, should not be very old or of one who died of any protracted disease or of poison." Kaviraj K. L. Bhisagratna, the translator of *Sushruta Samhita* makes the following remarks on Sushruta's method of dissection : –

It is certainly an undeniable fact that one of colossal achievements of the modern Western Medical Science is its Anatomy; but the point at issue is whether the process of laying open the structures of the body with the lancets, is at all a satisfactory method. For, is it not a fact that the finest and the minutest arteries of the skin are never disclosed, if the scalpel is used so recklessly as to remove the skin all at once and not allowed to go deeper into the muscles to expose the minute branches of blood vessels and nerves that may happen to lie therein ? But on the contrary, look at the process promulgated by Sushruta for demonstrating practical anatomy ! Its originality and perfection beats hollow all the known methods, although it was discovered in almost the prehistoric age. The process prescribed by the Hindu system is as follows : – Cover a dead body with *kusa grass* and place it at the edge of the water of a rivulet. After three days take it out carefully, and gradually take off the successive layers of the epidermis and dermis and of the muscles beneath by gently and lightly rubbing it over with a soft brush. Thus the smallest and the thinnest arteries, which have by this time swelled and obtained a distinct existence are made palpable everywhere even to the minutest.

"The process is termed, as we have pointed before, *Avagharshana* by Sushruta. The Western method might be an

easier and more off-hand one, but by no means precise. Though the merit of discovering this mode of dissection is due to Sushruta we are all blind to it and call Hippocrates the father of Medicine! It is generally believed that with a view to further his researches and perfect his knowledge, it is Hippocrates who inaugurated the system of dissection of dead human bodies and he did the work secretly. Credulous people may lend a willing ear to such assertions but the fact is, that it was not till a century, later than Hippocrates that Hirophilus openly resorted to dissection of human bodies and thereby earned an undying fame in Europe, obliterating Sushruta's name for ever, though, virtually speaking, he (Sushruta), was the pioneer of dissection and figured in the world more than a millennium before the advent of Hippocrates and over eleven centuries prior to the age of Hirophilus."

The plastic and rhinoplastic surgery is another gift of India bestowed upon the Western people. "The whole plastic surgery," says Dr. Hirschberg, "took a new flight when the cunning devices of the Indian workmen became known to us." Weber, in his History of Indian Literature says, "In surgery too, the Indians seem to have attained a thorough proficiency and in this department, European nations might even at the present day still learn something from them, as indeed they have already borrowed from them the operation of Rhinoplasty." Ayurveda is the first system to describe the transplantation of a sensible skin flap in order to mend a clipt ear-lobe, the flap being scraped from the neck or the adjoining part. The process of affixing an artificial nose is described as follows : –

विश्लेषितायास्त्वथ नासिकाया
वक्ष्यामि संधानविधिं यथावत् ।
नासाप्रमाणं पृथिवीरुहाणां
पत्रं गृहीत्वा त्ववलम्ब्य तस्य ।।
तेन प्रमाणेन हि गण्डपार्श्वा-
दुत्कृत्य बद्धं त्वथ नासिकाग्रम् ।
विलिख्य चाशु प्रतिसंद्धीत
तत् साधुबन्धैर्भिषगप्रमत्तः ।।
सुसंहितं सम्यगतो यथाव-
न्नाड़िद्वयेनाभिसमीक्ष्य बद्धा ।
प्रोन्नम्य चैनामवचूर्णयेत्तु
पतङ्गयष्टीमधुकाञ्जनैश्च ।।
संछाद्य सम्यक् पिचुना सितेन
तैलेन सिश्चेदसकृत्तिलानाम् ।
घृतं च पाय्यःस नरः सुजीर्णे
स्निग्धो विरेच्यः स यथोपदेशम् ।।
रूढं च संधानमुपागतं स्यात्
तदर्द्धशेषं तु पुनर्निकृन्तेत ।
हीनां पुनर्वर्द्धयितुं यतेत
समां च कुर्य्यादतिवृद्धमांसाम् ।।

"Now I shall deal with the process of affixing an artificial nose. first the leaf of a creeper, long and broad enough to fully cover the severed or clipped off part, should be gathered; and a patch of living flesh, equal in dimension to the preceding leaf should be sliced off (from down upward) from the region of the cheek and, after scarifying it with a knife,

swiftly adhered to the severed nose. Then the cool-headed physician should steadily tie it up with a bandage decent to look at and perfectly suited to the end for which it has been employed *(Sadhu Bandha)*. The physician should make sure that the adhesion of the severed parts has been fully effected and then insert two small pipes into the nostrils to facilitate respiration, and to prevent the adhesioned flesh from hanging down. After that, the adhesioned part should be dusted with the powders of *Patanga, Yashtimadhuka,* and *Rasanjana* pulverised together; and the nose should be enveloped in *Karpasa* cotton and several times sprinkled over with the refined oil of pure sesamum. Clarified butter should be given to the patient for drink, and he should be anointed with oil and treated with purgatives after the complete digestion of the meals he has taken, as advised (in the books on medicine). Adhesion should be deemed complete after the incidental ulcer has been perfectly healed up, while the nose should be again scarified and bandaged in the case of a semi or partial adhesion. The adhesioned nose should be tried to be elongated where it would fall short of its natural and previous length, or it should be surgically restored to its natural size in the case of the abnormal growth of its newly formed flesh."

There are seven different surgical procedures described by Sushruta in connection with an abscess :–

आदौ विम्लापनं कुर्य्याद् द्वितीयमवसेचनम् ।
तृतीयमुपनाहं तु चतुर्थी पाटनक्रियाम् ॥
पञ्चमं शोधनं कुर्य्यात् षष्ठं रोपणमिष्यते ।
एते क्रमा व्रणस्योक्ता सप्तमं वैकृतापहम् ॥

"These are the seven procedures to be adopted in treating an abscess, 1. *Vimlapanam* (mutilation), 2. *Avasechanam* (bleeding or application of leeches), 3. *Upanaham* (poulticing), 4. *Patanam* (opening or incision), 5. *Shodhanam* (purification of the internal morbid mater of an incised boil with corrective medicines), 6. *Ropanam* (healing), and 7. *Vaikritapaham* (restoring of the natural colour of the skin to the cicatrix)."

It may be noticed that the process of Vaikritapaham is still foreign to Western surgery. The *Upanaham,* or bleeding has not met the many sided development in modern surgery which it had met at the hands of the Ayurvedic physicians. Different sorts of applications were required in cases of disease where bleeding was necessary. Some of them, such as leeches, cups, horns, etc., are still used with great success in various parts of the country. The choice of the instruments of bleeding depends upon the nature of the disease. A separate chapter has been devoted to the classification, identification, and choice of the various forms of leeches by Sushruta.

All the surgical operations are classified and grouped under eight heads :-

तच्च शस्त्रकर्म्माऽष्टविधम् । तद्यथा-छेद्यं, भेद्यं, लेख्य, वेध्यं, एष्यं, आहार्य्यं, विस्त्राव्यं, सीव्यमिति ।

"Surgical acts or operations are divided into eight different kinds such as Amputating *(Chhedya)*, Excising *(Bhedya)*, Scraping *(Lekhya)*, Puncturing *(Vedhya)*, Searching or probing *(Eshya)*, Extracting *(Aharya)*, Evaçuating fluids *(Visravya)*, and suturing *(Sivya)*."

The entire course of medical treatment in each disease consisted of *Purva Karma* (Preliminary measures), *Pradhana Karma* (Principal therapeutical or surgical measures), and *Pashchata Karma* (After measures). A practitioner, "otherwise well read, but uninitiated into the practice of surgery is not competent to take in hand surgical cases." He should steady his hand for future practice on the following objects :-

तत्र पुष्पफलालाबूकालिन्दकत्रपुसैवीरुककर्कारुक प्रभृतिषु छेद्यविशेषान् दर्शयेत्ण उत्कतेनपरिकर्तनानि चोपादिशेत; दृतिबस्तिप्रसेवकप्रभृतिषु उदकपङ्कपूर्णेषु भेद्ययोग्याम्; सरोमणी चर्मणि आतते लेख्यस्य; मृतपशुशिरासु उत्पलनालेषु च वेध्यस्य; घुणोपहतकाष्ठवेणुनलनालीशुष्कालाबूमुखेषु एष्यस्य; पनसबिम्बीबिल्वफलमज्जामृतपशु दन्तेषु आहार्य्यस्य; मधूच्छिष्टोपलिप्ते शालमलीफलकेविस्त्राव्य; पुस्तमयपुरुषाङ्गप्रत्ययङ्गविशेषेषु बन्धनयोग्याम्; (मृदुषुमांसखण्डेषु अग्निक्षारयोग्याम् ।) मृदुचर्म्ममांसपेशीषु उत्पलनालेषु च कर्णसन्धिबन्धयोग्यां; उदकपूर्णघटपार्श्वस्त्रोतसि अलाबुमुखादिषु च नेत्र प्रणिधानबस्तिपीड़नयोग्यामिति।

सुश्रुत सूत्र. अ ९, सू. ४

"The art of making specific forms of incision should be taught by making cuts in the body of a *Pushpaphala* (a kind of gourd), *Alavu*, water melon, cucumber, or *Ervaruka*. The art of making cuts either in the upward or downward direction should be similarly taught. The art of making openings, in the body of a full water-bag, or in the bladder of a dead animal, or in the side of a leather pouch full of slime or water. The art of scraping should be instructed on a piece of skin on which the hair has been allowed to remain. The art of venesection *(Vedhya)* should be taught on the vein of a dead animal, or

with the help of a lotus stem. The art of probing and stuffing should be taught on worm *(Ghuna)*-eaten wood, or the reed of a bamboo, or on the mouth of a dried *Alavu* (gourd). The art of extraction should be taught by withdrawing seeds from the kernel of a *Bimbi*, *Bilva* or Jack fruit, as well as by extracting teeth from the jaws of a dead animal. The art of secreting or evacuating should be taught on the surface of a *Shalmali* plank covered over with a coat of bee's wax, and suturing on pieces of cloth, skin, or hide… Similarly the art of ligaturing or bandaging should be practically learned by tying bandages round the specific limbs and members of a full-sized doll made of stuffed linen. The art of tying up a *Karana-sandhi* (severed earlobe) should be practically demonstrated on a soft severed muscle or on flesh, or with the stem of a lotus lily. The art of cauterising or applying alkaline preparations (caustics) should be demonstrated on a piece of flesh; and lastly the art of inserting syringes and injecting enemas into the region of the bladder or into an ulcerated channel, should be taught (by asking the pupil) to insert a tube into a lateral fissure of a pitcher, full of water, or into the mouth of a gourd *(Alavu)*."

Thus we find that surgery was practised on a very large scale by the ancient Hindus, and a very comprehensible and practical amount of knowledge is still available from the works extant on Ayurveda. From the scanty materials available it is clear that the Ayurvedic physicians were very far in advance of the Western surgeons of today. Sir William Hunter writes, "The surgery of the ancient Indian physicians was skilful. They conducted amputations, arresting the bleeding by pressure, a cup-shaped bandage, and boiling oil; practised lithotomy, performed operations in the abdomen and

uterus; cured hernia, fistula, piles; set broken bones and dislocations; and were dextrous in the extraction of foreign substances from the body. A special branch of surgery was devoted to rhinoplasty, or operation for improving deformed ear and noses and forming new ones, a useful operation which European surgeons have now borrowed. The ancient Indian surgeons also mention a cure for neuralgia analogous to the modern cutting of the fifth nerve above the eyebrow. They devoted great care to the making of surgical instruments and to the training of students by means of operations performed on wax spread on board or on the tissues and cells of the vegetable kingdom, and upon dead animals. They were expert in midwifery, not shrinking from the most critical operations, and in the diseases of women and children." Dr. Seal writes, "Post mortem operations as well as major operations in obstetric surgery (the extraction of foetus, etc.) were availed of for embryological observations."

The art of bandaging and soft stuffing (tow) has been treated with great care and displays a high degree of surgical skill. Certain plasters were applied to localise foreign bodies embedded in the limbs of the warriors and their exact locations found out by the inflammation of the spots, caused by the application of these plasters. "Locations were ascertained," writes K. L. Bhishagratna, "by the application of certain plasters...... with a precision which would be sometimes welcome even in these days of Roentgen rays." Cataract-couching was for the first time discovered by the Hindus, who were efficient in reducing hernia and ruptures, setting the fractures, and the removal of fistula and haemorrhoids. "In the case where the intestines are injured,

Sushruta advises that the protruded part should be gently replaced by following with finger. A surgeon should enlarge the wound in it if necessary, by means of a knife. In case where the intestine is severed, parts should be held together by applying living black ants to their ends. Then their bodies should be cut off leaving only the heads to serve the same purpose which in modern improved European surgery an animal tissue like catgut is expected to fulfil. After this the intestine should be fairly replaced in the abdominal cavity and the external opening stitched and properly dressed." –K.L.Bhishagratna.

Traumatic ulcers have been divided into six classes and the surgical and medical treatment laid down for them is highly efficient. Sushruta says :–

"Physicians of yore have grasped these variously shaped traumatic ulcers under six broad sub-heads, such as the Chhinna (cut), Bhinna (punctured or perforated), Viddha (pierced), Kshata (contused), Pichchita (crushed), and the Ghrishta (mangled or macerated), according to their common features.

The use of anaesthetics was well known to the Hindu physicians. The use of medicinal wines is recommended to produce insensibility to pain. *Sammohana* and *Sanjivana* powders are mentioned to make the patient insensible and then restore him to consciousness after the operation is over. Cranial surgery is said to have been practised on Daksha Prajapati and Bhoja of Dhar with almost an incredible success. This may therefore be considered as fairly established that not only was the surgery of the Hindus prior

to that of any other people of the world but had attained a high scientific value at a pre-historic period.[1]

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[1] The evidence in favour of the originality of the Hindu medicine is so strong that even the supporters of Greek priority have had to acknowledge it, though in somewhat shy terms. The following extract from a well-known work of the West would serve as an interesting example of an author, giving way in favour of India though he seems to have taken for granted the priority of the Greek culture as an established fact :– In both branches of the Aryan stock; surgical practice, as well as medical, reached a high degree of perfection at an early period.

The correspondence between the *Sushruta* and the Hippocratic collection is closest in the sections relating to the ethics of medical practice; the description also, of lithotomy in the former agrees almost exactly with the account of Alexandrian practice as given by Celsus. But there are certainly some dexterous operations described in Susruta (such as the rhinoplastic) which were of native invention ; the eleborate and lofty ethical code appears to be of pure Brahmanical origin; and the very copious Materia Medica (which included arsenic, mercury, zinc, and many other substances of permanent value) does not contain a single article of foreign source. Susruta describes more than one hundred surgical instruments, made of steel. They should have good handles and firm joints, be well polished and sharp enough to divide the hair; they should be perfectly clean and kept in flannel in a wooden box. They included various shapes of scalpels, bistouries, lancets, scarifiers, saws, bone-nippers, scissors, trocars, and needles. There were also blunt hooks, loops, probes (including a caustic holder), directors, sound, scoops and forceps (for polypi etc.,) as well as catheters, syringes, a rectal speculum, and bougies. There were fourteen varieties of bandage. The favourite form of splint was made of thin slips of bamboo bound together with string and cut to the length required. Wise says that he has

frequently used "this admirable splint," particularly for fractures of the thigh, humerus, radius and ulna and it has been subsequently adopted in the English army under the name of the "patent rattan cane splint." Fractures were diagnosed, among other signs by crepitus. Dislocations were elaborately classified, and the dirfferential diagnosis given; the treatment was by traction and countertraction, and other dexterous manipulations. Wounds were divided into punctured, lacerated, contused, etc. Cuts of the head and face were sewed. Skill in extracting foreign bodies was carried to a great height, the magnet being used for iron particles under certain specified circumstances. Inflammations were treated by the usual antiphlogistic regimen and appliances; venesection was practised at several other points besides the bend of the elbow; leeches were more often resorted to than the lancet, cupping also was in general use. Poulticing, fomenting, and the like were done as at the present. Amputation was done now and then notwithstanding the want of a good control over the hoemorrhage; boiling oil was applied to the stump, with pressure by means of a cupformed bandage, pitch being sometimes added. Tumours and enlarged lymphatic glands were cut out and an arsenical salve applied to the raw surfaces to prevent recurrence.

Abdominal dropsy and hydrocele were treated by tapping with a trocar and varities of hernia were understood, omental hernia being removed by operation on the scrotum. Aneurisms were known but not treated.

Besides the operation already mentioned, the abdomen was opened by a short incision below the umbilicus slightly to the left of the middle line, for the purpose of removing intestinal concretions or other obstruction (laparotomy). Only a small segment of the bowel was exposed at a time; the concretion when found was removed, the intestine stitched together again, anointed with ghee and honey, and returned into the cavity. Lithotomy was practised, without the staff. There was a plastic operation for the restoration of the nose, the skin being taken from the cheek

In practical midwifery the evidence is still more astonishing. "The application of forceps in cases of difficult labour, the different turning, flexing and gliding movements and other obstetric operations involving the destruction and mutilation of the child, such as craniotomy, were first systematically described in the *Sushruta Samhita* long before fillets and forceps were dreamt of in Europe, and hundreds of years before the birth of Christ. Sushruta, who advocates Caesarean section in hopeless cases of obstruction, lays down, that the instrument should be employed only in those cases where the proportion between the child and the maternal passage is so defective that medicated plasters, fumigations etc., are not sufficient to effect a natural delivery." – K. L. Bhishagratna.

The advances made by the ancients in the science of chemistry are very valuable. The application and administration of chemicals in the treatment of various diseases began at an early date. Charaka prescribes copper and iron sulphates, realgar, orpiment, and sulphur, combined with vegetable drugs in ring-worm, eczema, leprosy and psoriasis, keloid and other cutaneous diseases. Iron, copper,

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adjoining, and the vascularity kept up by a bridge of tissue. The ophthalmic surgery included extraction of cataract. Obstetric operations were various, including caesarian section and crushing the foetus.

The medication and constitutional treatment in surgical cases were in keeping with the general care and elaborateness of their practice, and with the copiousness of their materia medica." – ENCYCLOPAEDIA BRITANNICA, Vol. XXII, p. 672. Ninth Edition.

sulphide of antimony, bone of frog, & c., form the ingredients of a collyrium. The iron and copper are interpreted here as the calces thereof. The ashes of iron, silver, and gold, are given as tonics, and mercury is extensively used in various diseases of the genital organs. Sushruta makes free use of the caustics and describes the methods of preparing oxides, sulphates, and chlorides of tin, iron, lead, copper, silver etc. Vegetable alkalis were prepared from various plants and herbs like *Kutaja* (Hollarrhena antidysentrica), *Palasha* (Butea frondosa), *Aswakarna* (Shorea robusta), *Paribhadra* (Erythrina indica), *Vibhitaka* (Terminalia bellerica), *Aragvadha* (Cassia fistula), *Tilvaka* (Symplocos racemosa), *Arka* (Calotropis gigantica), *Snuhi* (Euphorbia nerifolia), and numerous others. The alkalis were rendered caustic by special chemical processes. Aconite root, carbonate of soda, asafoetida, black salt and coral are used in conjunction with other ingredients to prepare strong alkaline caustics which are used for 'bringing to a head' or opening abscesses. Acids were known to neutralise alkalis, and processes of calcination and sublimation were conducted. Mercury was extracted from cinnabar for the first time by the Hindu chemists, and their claim to priority in making mercurial preparations a speciality is undisputed. Alkalis, acids, oils, fats, urines, of various animals, earths, and various poisons were analysed and their medical properties discovered and recorded.

Sir P. C. Ray writes, "Contemporary collateral records by foreign writers go to corroborate the date of the alchemical *Tantras* tentatively fixed by us, as the name and fame of mercurial remedies as used by the Hindu Yogis had spread far and wide. The following two extracts will suffice : –

"There is another class of people called Chughi (yogi), who were indeed properly Abraiman, but they form a religious order devoted to the idols. They are extremely long-lived, every one of them living to 150 or 200 years. They eat very little····· and these people make use of a strange beverage,[1] for they make a potion of sulphur and quick-silver mixed together, and this they drink twice every month. This they say gives them long life; it is a potion they are used to take from their childhood " – Yule's *Marco Polo, Vol, II. p.300*

"Arghun[2], der Alchymie und den geheimen Wissenschaften ergeben hatte indisehe; Bachschi, d. h. Schreiber, gefragt, durch welche Mittel sie sich ihr Leben so langwierig fristehen. Sie gaben ihm ein aus Schwefel und Merkur zusammengesetztes Mittel als die Panacee der Lebensverlang-erung ein. (1290 A.D.)–Hammer-Purgs tall; Geschichte der llchane, I.p.391."

"We have only to refer our reader," continues Dr. Ray "to the chapter on the preparation of the caustic alkalis in the

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[1] The word 'beverage' seems to imply a misunderstanding on the part of the original writer. Rasa, from which Rasayana is derivated, is not limited in its sense to liquids only, in fact rasa is more often used for such preparations as prolong life or prove beneficial to the entire system e.g. *Makaradhwaja, Rasa-sindura, Mrityunjaya*, etc.

[2] Arjun, who was devoted to alchemy and secret sciences had asked Indian Bakhshi, i.e. Scribe, by which means did they manage to make their lives long. They made him take a drug composed of Sulphur and Mercury as the panacea for the prolongation of life.

Sushruta with the direction that the strong lye is to be 'preserved in an iron vessel' as a proof of high degree of perfection in scientific pharmacy achieved by the Hindus at an early age. It is absolutely free from any trace of quackery or charlatanism." R. C. Dutta says, "We cannot help admiring the ingenuity and the boldness of the Hindu physicians using such powerful drugs as arsenic, mercury, iron etc., when the Mussalman hakims round them with imperial patronage and the boasted learning of the West recording such remarks regarding them as the following :–

"*Soomboolkhar*," 'The white oxide of arsenic' - There are six kinds of this, one named *Sunkia*, the third *Godanta*, the fourth *Darma*, the fifth *Huldea*... The *Yunani* physicians do not allow this to form a part of their prescriptions, as they believe it destroys the vital principle. The physicians from India, on the contrary, find these drugs more effectual than others of less power such as the calx of metals. For this reason too I am in the habit of seldom giving these remedies internally, but I usually confine my use of them to external application and as aphrodisiacs which I prescribe to a few friends, who may have derived no benefit from *Yunani* prescriptions. It is better to use as few of them as possible." – *Taleef Sharif* trans. George Playfair. p.99.

"*Para*, 'Mercury' – It is very generally used throughout India in many ways, both in its native and prepared state, but in the latter we ought to be very cautious, for it is seldom sufficiently killed or removed from its native state, in which it is a dangerous drug." *Ibid*. P.26.

"Loha, 'Iron. – It is commonly used by physicians in India, but my advice is to have as little to do with it as possible." – Ibid. P. 146.

Yet Mr. Amir Ali states, "The Arabs invented chemical pharmacy and were the founders of those institutions which are now called dispensaries." It may be pointed out that Buddhistic India was studded with free dispensaries.

The knowledge of the medical properties of minerals, precious stones, and various carbonates of calcium is very old. The ashes of conch, coral, pearl, cowrie, and various other shells of the same chemical composition were discovered to possess distinctly different medical properties, and were extensively used.

The practice of physic included classifications, causes, symptoms, and treatment of diseases. Even to-day, after centuries of decay and devastation of their science, the Ayurvedic physicians excel in producing superior clinical results to the practitioners of the Western medicine, whose claims to its scientific nature are growing more and more aggressive.

The theory of the circulation of blood, discovered by Harvey in the sixteenth century A.D. was a familiar notion to the Hindus as early as the period of Charaka :–

तेन मूलेन महता महामूला मता दश ।
ओजोवहाः शरीरेऽस्मिन् विधम्यन्ते समन्ततः ।।

Ten big ducts connected with their root, the heart, circulate the blood, charged with vitality, throughout the entire body. The following verse describing the transaction of the nourishing fluids like blood, chyle, etc., between the mother and the foetus is another proof of keen observation :–

यत्सारमादौ गर्भस्य यत्तद्गर्भरसाद्रसः ।
संवर्तमानं ह्रदयं समाविशति यत्पुनः ।।

"Re-enters the heart" (समाविशति यत्पुनः) is circulation pure and simple.

Inoculation was practised in India independent of any foreign influence. Extracts to this effect from a paper entitled *An Account of the Manner of Inoculating for Small Pox in the East Indies*, read by Mr. J. Z. Holwell, F.R.S., in 1767, before the Royal College of Physicians in London, have been given by Dr. Mukherji in his valuable work, the *History of Indian Medicine*. Some of the extracts are quoted below :–

"Mr. Holwell observes that the 'salutary method (of inoculation of small-pox) now so happily pursued in England (howsoever it has been seemingly blundered upon) has the sanction of the remotest antiquity. For five and sometimes six years together it passes in a manner unnoticed from the few that are attacked with it, for the complexion of it in these years is generally so benign as to cause very little alarm; and notwithstanding the multitudes that are every year inoculated with it in the usual season, it adds no malignity to the disease taken in the natural way, nor spreads the infection as commonly imagined in Europe. Every seventh year, with scarcely any exception, the Small-Pox rages epidemically in these provinces, during the months of March, April, and May; until the annual returning rains, about the middle of June, put a stop to its fury. On these occasions the disease was of the most malignant confluent kind, from which few escaped that took the distemper in the natural way, and they commonly died on the first, second, or third day of eruption, and the Europeans usually fled from the settlements before the return of the small-pox season. There was hardly ever an instance of a native of the island of St. Helena, man or woman, who if attacked when in Bengal with the disease in a natural way, escaped with life.'

"There was reason to believe from the institution of offerings to the goddess of small-pox that the disease had existed from very remote times in India, and had indeed spread from it to the West. Inoculation was performed by Brahmans from Brindaban, Allahabad, Benares etc. over the country. They arrived in Bengal early in February or March before the usual return of the disease. The people prepared the patients for the operation by a restricted diet, and the Brahmans would not operate unless this had been done. The inoculators passed from house to house and operated at the doors asking how many pocks the parents wished, and preferred to operate, for males between the wrist and the elbow, and for females between the elbow and the shoulder. Fifteen or sixteen minute scarifications were made with an iron or steel instrument, and a rag charged with variolus matter from inoculated pustules of the previous year was allowed to remain on for about six hours. The wound was also moistened with Ganges water and the part was, in the first place, dry-rubbed for about seven or eight minutes ...Cold water was poured over the patient up to the time the fever appeared and again after the eruption came out until the scabs of the pustules dropped off; and restricted diet was ordered for a month. The pustules were opened with a sharp-pointed thorn. The patient was exposed freely to the air outside the house, and the eruptic fever was generally so slight as not to need much restriction. The operation rarely failed, nor did any one often miscarry under it, and the number of pustules was rarely less than fifty or more than two hundred.

"Although very early prejudiced against the cool regimen and the free admission of the air, Holwell soon came to the

conclusion that any one who did not adopt that treatment would lose many patients. He suggests reasons for agreeing with the Brahmans that it was wise to disallow the milk during the process of the affection and he then refers to their ideas as to the causation of the disease, which were as follows. The immediate cause of the small-pox was believed to exist in the mortal part of every human and animal form. In a footnote he states that at the time of the confluent small-pox epidemics turkeys and other poultry were carried off by the disease in great numbers, and even his own parrot was found on dissection to have as many pustules in his digestive tract as on his body. The mediate cause which stirred up the first and threw it into a state of fermentation was, it was considered, the presence of innumerable imperceptible animalcules floating in the atmosphere. These, they said, cause all epidemical diseases, and imprison most malignant spirits. These particles pass in and out of the respiratory tract without doing any harm, but cling to the food and especially to milk and other articles which the Brahmans prohibit when the diet is restricted. Holwell himself saw no reason why such pestilent animalculae, driven by certain winds, or generated on the spot by water and air in a state of stagnation and received into the body with food, should not be cause of the spread of malignant epidemics at particular seasons, and the epidemical blights, which may be observed to go often hand in hand with epidemical diseases, may be due to similar causes. The friction and the dilution with water seemed to promote absorption.

"Holwell particularly testifies to the value of the affusion of cold water from a height up to the time of the appearance of the fever, and again when the eruption comes out, and

further says that he was an eyewitness of its power and utility when the pustules had sunk. He agrees with the Brahmans in attaching great importance to opening the pustules with a thorn, as this mitigates or prevents the second fever. The opening with a thorn has also the advantage of the orifice being so small that there is no admission of air into the part. In conclusion, in laying great stress on the cool regimen and on the free admission of air he trusted they might be introduced into regular and universal practice" British Medical Journal, 1905, June 17, p. 1336.

Holwell's testimony as to the independent nature of inoculation in India is decisive, although there is no direct mention regarding the practice of inoculation in any of the ancient medical works of the Hindus, though we come across practices of injection etc. in Sushruta, which may be taken to indirectly suggest its presence in the ancient times. The following verses, however, quoted from Dhanvantari's *Shakteya Grantha* in the *Shabda Kalpadruma* describe in clear terms the process of vaccination as practised by the Hindus :–

धेनुस्तन्यमसूरी वा नराणाश्च मसूरिका ।
तज्जलं बाहुमूलाच्च शस्त्रान्तेन गृहीतवान् ॥
बाहुमूले च शस्त्रेण रक्तोत्पत्तिकरेण च ॥
तज्जलं रक्तमिलितं स्फोटकज्वरसंभवम् ॥

"Take the serum from the pustules on the teats of the cows or from the arms of men at the end of a knife, and introduce on the arm (of the child) caused by the scacification with a knife. The serum when mixed with blood (of the child) causes fever of smallpox."

The authenticity of this statement has been questioned by certain Western scholars, but it has found the support of His Excellency Lord Ampthill, and Lieut. Colonel W. G. King, I.M.S., C.I.E. (For full information on the subject, however, the reader is referred to the *History of Indian Medicine* by G. N. Mukerji pp. 114-132.)

Cholera is noticed, classified and treated by almost every old work on medicine under the names *Visuchika, Alasaka, Vilambika,* etc. Symptoms of cholera in its present form [1] are not ignored. Syphilis is known to Sushruta as *Upadansha,* and, in its new form, as introduced by the Portuguese or *Phirangees* into India, it has been noticed by Bhava Misra in his treatise Bhavaprakasa, under the name of *Phirangaroga.* Bhava Misra flourished in 16th century A.D.

Influenza is described by Sushruta in the following terms : –

विषौषधिपुष्पगन्धेन वायुना उपनीतेन आक्रम्यते यो देशस्तत्र दोषप्रकृत्यविशेषेण कासश्वासप्रतिश्यायशिरोरुग्ज्वरैरुपतप्यन्ते ।

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[1] "Dr. Mahendra Lal sircar in the Calcutta Journal of Medicine, of June and July 1833, proved by indirect evidence, quoting several ancient Hindu and Tibetan authourities on the subject, that cholera was not of Indian origin.

"I must conclude in the language of Dr. Sircar : 'Was Visuchika the primitive parent of cholera ? Is there evolution in disease as there is in animated nature ? This is a question well worth a most careful and searching investigation; for if solved in the affirmative will entirely open a new field of hygiene and therapeutics.' "

History of Indian Medicine

"When poisonous gases or (particles of) poisonous flowers or grasses borne by the wind, invade a country (or a part thereof), (the inhabitants), irrespective of their, constitutional peculiarities are attacked with epidemic cough, asthma, catarrh, vomiting and fever."

Rats are described by Sushruta as the cause of plague, and poisonous gases the cause of influenza, for which, in addition to various highly efficacious medical preparations for internal administration, germicidal and antiseptic drugs (Rishabhagada, Ksharagada, etc.) are prescribed for disinfectant purposes. The trumpets and drums should be smeared with these medicines, and beaten near the patient, the atmosphere should be purified with huge waving banners plastered with these *agads* (anti-toxic preparations), and fumes caused by burning quantities of *Valka*, *Kushta*, *Ati-visha* etc., in the open ground.

The blood or any other part of human body coming in contact with a secretion of an infected rat gives rise to the appearance of nodes, swellings, eruptions, pustules, fever, shivering, pain of body etc., (Sushruta, Kalpa. VI). Charaka, dwelling upon the causes of various epidemic diseases, gives the following dialogue : –

अग्निवेश उवाच ..... अपि तु खलु जनपदोद्ध्वंसनमेकेन व्याधिना युगपदसमानप्रकृत्याहारदेहबलसात्म्यसत्ववयसां मनुष्याणां कस्माद्भवतीति ।

तमुवाच भगवानात्रेयः । एवमसामान्यानामभिरप्यग्निवेश प्रकृत्यादिभिर्भावैर्मनुष्याणां येऽन्ये भावाः सामान्यास्तद्वैगुण्यात् समानकाला समानलिङ्गाश्च व्याधयोऽभिनिर्वर्तमाना जनपदमुद्ध्वंसयन्ति तद्यथा वा युरुदकं देशः काल इति ॥

"Agnivesha said, 'The question, however, is – How can the habitations of men who differ in nature, food, body strength, capacity of bearing particular things and practices, mind, and age, be simultaneously destroyed by one disease? '

"Unto him answered the illustrious son of Atri : 'O Agnivesha, of men differing from each other in these particulars viz., the circumstances of nature and the rest, there are other circumstances that are common (or similar); these last being perverted, diseases agreeing in point of time and of symptoms, break out and become destructive of habitations. Verily, there are these circumstances that are common to human habitations, viz., atmosphere, water, soil, and time." – Kaviratna's translation.

These four factors common to all inhabitants attacked by an epidemic are explained under separate headings and precautions laid down to prevent infection in a manner that would do credit to any modern scientist of the world.

The oil, fruit, and seeds of *Chaulmoogra* tree (तुवरक) were administered in leprosy by Sushruta thousands of years ago. Western doctors have only recently borrowed this treatment from India. Dr. Brett makes selections from various Ayurvedic compounds, which many able European practitioners have tried, and whose efficacy rests on the most unquestionable authority. "We are indebted to the Hindus," says Brett, "for almost every efficacious remedy in this disease." Sandes[1] considers *Chaulmoogra* oil superior to any other known remedy or reputed cure in leprosy.

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[1] Journal of Tropical Medicine and Hygiene, March 1, 1912.

Hygienic and prophylactic measures have received deserving attention. *Panchakarma* (the use of emetics, purgatives, fomentation, dry and oily enemata) was extensively practised. The medical treatment to haemorrhoids, urinary calculus, fistula-in-ano, minor and major cutaneous affections, dropsy, abscesses, tumours, erysipelas, sinus and diseases of the mammary glands and of the urino-genital tract, glandular swellings, goitre, hernia, hydrocele, scrotal tumour, elephantiasis, poisonous bite, and a host of other diseases, formed a different branch of the system from the surgical treatment. The practitioners of Western Medicine may perhaps be surprised to know that in many cases of urinary calculus, pieces of stone of a fair size are removed by the Ayurvedic physicians without any surgical treatment whatsoever. The exclusion of salt and water from the food of ascites or anasacra patients and the use of bitters in cases of fever display the high chemical knowledge of organic substances acquired by the ancients. Their acquaintance with the process of digestion, the properties and functions of fat, muscles, tendons, ligaments, etc., is highly creditable. Their methods of treatment, through centuries of assimilation into the Western medicine are still capable of supplying new material and teaching new lessons to the West. It is from them that Europe learnt the use of Datura stramonium in asthma, cowitch in worms. nux vomica in paralysis and dyspepsia, arsenic in intermittent fevers, mercury in syphilis, salt-free diet in Bright's disease, fatty substances in consumption, and mild purgatives in first stages of dysentery. The fasting of the patient in first stages of fever and the knowledge of auto-intoxication are only recent lessons taught to the West by Ayurveda, which also includes hypnotism, eugenics, massage,

postural treatment, organo-therapy, and sanitation, as some of its well developed branches. "The race system", says David C. Muthu, "is really at first aimed at preservation and perfection of race culture rather than the division of labour ... A modern Eugenist can go no further than Vasistha, a Vedic sage and another ancient law-giver, when advising the desirability of marrying a bride from a good family, he says, 'Even a horse is respected on account of its good geneology, hence a lady of good geneology should be taken into marriage.' Their prescriptions to ward off old age and restore vigour and immunity are still unmatched for the potency of their results. "When we add to these," says Dr. Muthu, "their knowledge of Anaesthetics and the germ theory, we cannot but exclaim that there is nothing new under the sun."

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CHAPTER V

THE FUNDAMENTAL PRINCIPLES OF AYURVEDA–I

The (Western) Doctors take into account the Seed only ignoring the Soil. Hence they miserably fail in attaining the results desired... In other words drugs to be successfully used for cure must be studied from Sympathetico-Endocrinological or *Tridosha* point of view.

Journal of Ayurveda, June 1927.

The word Ayurveda (आयुः Life, वेदः Science) literally means the science of life, and as such, the application of the term is not restricted to the department of medicine and surgery only, but has a much wider range. A science treating of life cannot ignore the most important question of organic evolution and this in its turn leads to dissertations on the equally important problem of the evolution of the cosmos. It is from cosmic evolution upwards, therefore, that the study of Ayurveda begins. This may be pointed out, however, to the credit of the ancients, that though their science begins with the most difficult problem of the cosmic evolution, their conception of this subject is far from vague and in no way a product of mere speculation. Their clear and faultless exposition testifies that they arrived at these results through positive and scientific reasoning based on keen observation of the natural phenomena. As we go deeper into the details of the evolution of cosmos from the formless, unmanifest, and limitless Prakriti, the ultimate ground it becomes clear that they have proceeded, in their analysis of the phenomena of nature from the known to the unknown, solving the mysteries of nature with their accumulated stock of knowledge; and not

from the unknown to the known or from the unreal to the real, reconciling the inconsistencies through mere speculative reasoning. The Ayurvedic theory of Evolution is a combination of *Sankhya, Patanjala, Nyaya, and Vaisheshika* systems of Indian philosophy in their most scientific aspect. The *Sankhya-Patanjala* system, which is mostly adhered to or which may be said to have followed the Ayurvedic precepts more closely in its main structure,[1] "possesses a unique interest in the history of thought as embodying the earliest clear and comprehensive account of the process of cosmic evolution viewed not as a mere metaphysical speculation but as a positive principle based on the conservation, the transformation, and the dissipation of energy."

The Ayurvedic conception of evolution rests somewhere between the *Sankhya-Patanjala* and the *Nyaya-Vaisheshika* theories. Both these theories have been treated at length by that great savant of Oriental learning, Dr. Brajendra Nath Seal, in his learned and erudite work, *The Positive Sciences of the Ancient Hindus*. Reproduced below is an abridged extract from this work to present the idea of evolution as conceived by the early Ayurvedic writers. I have substituted Ayurvedic texts here and there, instead of the original ones, where necessary, for the purpose of conviction and illustration.

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[1] *The six systems of Indian philosophy are believed by some to be the outcome of the Ayurvedic science. See the treatment of the mental diseases in the next chapter.*

THE COSMIC EVOLUTION

"The manifested world is traced to an unmanifested ground, *Prakriti*, which is conceived as formless and undifferentiated, limitless and ubiquitous, indestructible and undecaying, ungrounded and uncontrolled, without beginning and without end. But the unity of *Prakriti* is a mere abstraction, it is in reality a differentiated manifold, an indeterminate infinite continuum of infinitesimal Reals. These Reals, termed *Gunas* (गुणाः) may by another abstraction be classed under three heads: (1) *Sattva*, the Essence which manifests itself in a phenomenon, and which is characterised by the tendency to manifestation, the Essence, in other words, which serves as the medium for the reflection of Intelligence: (2) *Rajas*, Energy, that which is efficient phenomenon, and is characterised by a tendency to do work or overcome resistance, and (3) *Tamas*, Mass or Inertia, which counteracts the tendency of *Rajas* to do work, and of *Sattva* to conscious manifestation."

Sushruta describes *Prakriti*, the ultimate ground, in the following terms:–

सर्वभूतानां कारणं, अकारणं, सत्वरजस्तमो लक्षणं, अष्टरूपं, अखिलस्य जगतः संभवहेतुः अव्यक्तं नाम ...... etc.

सुश्रुत. शारीर. अ १,. सू १.

"Progenitor of all creation, Self-begotten, Connotation of the three Reals. *Sattva, Rajas* and *Tamas*, Existing in Eight Forms (अव्यक्त, महान्, अहङ्कार, and शब्द -, स्पर्श-, रूप-, रस-, गन्ध- तन्मात्राणि) the Sole Cause or Factor in the evolution of the

universe. This is named *Avyakta* or unmanifest- *Sharirasthana,* I, 1.

It is also described as beginningless (अनादि), endless and limitless (अनन्त), inconceivable, unknowable, and formless (अलिङ्ग) everlasting and indestructible (नित्य), unexcelled (अपर) and ubiquitous (सर्वगत)

The three *Gunas* (Sattva, Rajas, and Tamas) which are the sole constituents of *Prakriti*, are the ultimate factors of the Universe. These are 1. Essence or intelligence-stuff. (2) Energy, and (3) Matter characterised by mass or inertia. Although these *Gunas* are conceived to be Reals, substantive entities, they are not self-subsistent or independent entities (प्रधान) but as interdependent moments in every real or substantive Existence.

Even Energy is substantive in this sense. The infinitesimals of Energy do not possess inertia or gravity and are not therefore material, but they possess quantum and extensity (परिमाण-परिच्छिन्नत्व). The very nature of Energy is therefore ultimately kinetic, even potential Energy is only the Energy of motion in imperceptible forms."

These three Reals, *Sattva, Rajas, and Tamas* enter everything in close union as essential constitutive factors. "The Essence of a thing *(Satva)* is that by which it manifests itself to intelligence, and nothing exists without such manifestations in the Universe of Consciousness. But the Essence is only one of the moments. It does not possess mass or gravity, it neither offers resistance nor does work. Next

there is the element of *Tamas*, mass, inertia, matter-stuff, which offers resistance to motion as well as to conscious reflection. All work comes from *Rajas* only which overcomes the resistance of matter, and supplies even the intelligence with the energy which it requires for its own work of conscious regulation and adaptation."

"The *Gunas* are always uniting, separating, uniting again. Everything in the world results from their peculiar arrangement and combination. Varying quantities of Essence, Energy, and Mass, in varied groupings act on one another, and through their mutual interaction and interdependence evolve from the indefinite or qualitatively indeterminate to the definite or qualitatively determinate. But though cooperating to produce the world of effects, these divers tendencies never coalesce. In the phenomenal product whatever Energy there is due to the element of *Rajas* and *Rajas* alone; all matter resistance, stability is due to *Tamas* and all conscious manifestation due to *Sattva*.

"The nature of the interaction is peculiar. In order that there may be evolution with transformation of Energy, there must be a disturbance of equilibrium, a preponderance of either Energy, or Mass-resistance or Essence over the other moments. The particular *Guna* which happens to be predominant in any phenomenon becomes manifest in that phenomenon and the others become latent, though their presence is inferred by their effect. For example, in any material system at rest the Mass is patent, the Energy Latent, and the Conscious manifestation sub-latent. In a moving body the *Rajas* Energy, is predominant (Kinetic), while the Mass, or rather the resistance it offers, is overcome. In the volitional

consciousness accompanied with movement, the transformation of Energy (or work done by *Rajas*) goes hand in hand with the predominance of the Conscious manifestation, while the matter-stuff or Mass, though latent, is to be inferred from the resistance overcome.

"The Starting-Point in the Cosmic history is a condition of equilibrium or equipoise consisting in a uniform diffusion of the Reals. The tendencies to conscious manifestation as well as the powers of doing work, are exactly counterbalanced by the resistance of the inertia or Mass : the process of cosmic evolution (परिणाम) is under arrest. The transcendental (non- mechanical) influence of the *Purusha* (the Absolute) puts an end to this arrest, and initiates the process of creation. Evolution begins with the disturbance of the original equilibrium... The particles *Sattva, Rajas, and Tamas* possess a natural affinity for other particles of their own class and when the transcendental influence of the *Purusha* ends the state of arrest, the affinity comes into play, breaks up the uniform diffusion, and leads to unequal aggregation, and therefore to the relative preponderance of one or more of the three *Gunas* over the others. Thus commences formative combination among the Reals, and consequent productive activity.

"Creative transformation accompanied with evolution of motion (परिस्पंद) and work done by energy (क्रिया) cannot take place without a peculiar collocation of the Reals. To form wholes or systems it is essential that one Guna for the moment be preponderant and the other co-operant. And this

cannot be without an unequal aggregation which overthrows the original equilibrium (गुणवैषम्य, न्यूनाधिकभाव) –in other words, without unequal forces or stresses coming into play in different parts of the system... Evolution in its formal aspect is defined as differentiation in the integrated. In other words the process of evolution consists in the development of the differentiated (वैषम्य), within the undifferentiated (साम्यावस्था), of the determinate (विशेष) within the indeterminate (अविशेष) of the coherent (युतसिद्ध) within the incoherent (अयुतसिद्ध)."

The order of cosmic evolution, according to one authority, is shown below :–

Prakriti, the unmanifested unknowable ground –

(गुढ़मव्यक्तमलिङ्गम् ।)

|

Cosmic matter of experience (महत् लिङ्ग)

Subject Series (अविशेष)	Object Series (अविशेष) evolved in the cosmic matter of experience but through the mediation of the individuated mind-stuff अस्मिता (*Ahankara*)
Individuated indeterminate mind-stuff (unity of apperception, empirical ego (अस्मिता)	Individuated but indeterminate matter-stuff (subtile material potencies (तन्मात्र)
|	|
Determinate mind-stuff (विशेष). Sensory and motor psychoses etc. (ज्ञानेन्द्रिय,	Determinate matter-stuff (विशेष) atomic and molecular constituents of

कर्मेन्द्रिय, मनः)

gross matter (परमाणु स्थूलभूत)

|

Coherent and integrated matter-stuff (द्रव्य).

Individual substances, with generic and specific characters subject to constant change or evolution e.g., inorganic objects composed of atoms or molecules (परमाणु)

vegetable organisms (वृक्ष)

animal organisms (शरीर).

The manifested knowable Universe, cosmic matter of experience, things as matter or stuff of consciousness (लिङ्ग) comprising Mahat, the intelligible Essence of the Cosmos, is evolved by differentiation and integration within the formless, characterless, and inconceivable Prakriti. This cosmic matter of Experience (लिङ्ग महत्) evolves within itself by the same process of differentiation and integration an individuated but still indeterminate matter-stuff (अहङ्कार) in two co-ordinated series Subject and Object, comprising on one hand the indeterminate unity of apperception, or the empirical Ego, as the co-ordinating principle of the Subject series, and on the other hand, the indeterminate material potencies, the subtile vehicles of potential Energy (तन्मात्र सूक्ष्मभूत्), the ultimate subtile constituents of the Object series (the material world).

The Subject – and object-experience evolving into determinate from indeterminate produce on one side the sensory and motor stuff (एकादशेन्द्रियाणि) and on the other coherent and integrated matter-stuff, individual substances characterised by generic and specific properties."

Sushruta gives the following of the above mentioned twenty-four fundamental principles in the history of evolution. *Prakriti*, *Mahat, Ahankara,* and then the bifurcation into 1. Subject series, comprising five *Jnanendriyas*, five *Karmendriyas* and *Manas* (पश्चज्ञानेन्द्रियाणि, पश्चकर्म्मेन्द्रियाणि, एकं मनः – sensory, motor and common sensory-motor); and 2. Object series, comprising the five *Tanmatras* (तन्मात्राणि) subtile material potencies) and the five *Mahabhutas (पश्चमहाभूत) Akasha, Vayu, Tejas, Ap, and Urvi)* –

तस्मादव्यक्तान्महानुत्पद्यते तल्लिङ्ग एव। तल्लिङ्गाच महतस्तल्लिङ्ग एवाहङ्कार उत्पद्यते,सच त्रिविधो वैकारिकस्तैजसो भूतादिरिति । तत्र वैकारिकादहङ्कारात्तैजससाहय्या-त्तल्लक्षणापयेवैकादशेन्द्रियाण्युत्पद्यन्ते । तद्यथाश्रोत्रत्वक्चक्षुर्जिह्वाघ्राणवाग्यस्तो-पस्थपायुपादमनांसीति । तत्र पूर्वाणि पञ्च बुद्धीन्द्रियाणि इतराणि पञ्चकर्म्मेन्द्रियाणि, उभयात्मकं मनः। भूतादेरपि तैजससहायात् तल्लक्षणान्येव पञ्चतन्मात्राण्युत्पद्यन्ते । तद्यथा-शब्दतन्मात्रं, स्पर्शतन्मात्रं, रूपतन्मात्रं रसतन्मात्रं गन्धतन्मात्रमिति तेषां विशेषाः शब्दस्पर्शरूपरसगन्धास्तेभ्यो भूतानि व्योमानिलानलजलोर्व्यः । एवमेषां तत्वचतुर्विंशतिर्व्याख्याता॥ सूश्रुत शारीर, अध्याय १, सूत्र ३-४

These twenty-four forms of *Prakriti* are the field (क्षेत्र) in which the individual soul (क्षेत्रज्ञ) descends under certain

concomitant conditions. Sushruta's conception of the Purusha or individual self is as follows :–

न चायुर्वेदशास्त्रेषूपदिश्यन्ते सर्वगताः क्षेत्रज्ञा नित्याश्च असर्वगतेषु च क्षेत्रज्ञेषु नित्येषु पुरुषख्यापकान्हेतूनुदाहरन्ति । आयुर्वेदशास्त्रेष्वसर्वगताः क्षेत्रज्ञा नित्याश्च तिर्यग्योनिमानुषदेवेषु संचरन्ति धर्म्माधर्म्मनिमित्तम् । त एतेऽनुमानग्राह्याः परमसूक्ष्माश्चेतानावन्तअ शाश्वता लोहितरेतसोः सन्निपातेष्वभिव्यज्यन्ते । यतोऽभिहितं पञ्चमहाभूतशरीरिसमवायः पुरुष इति स एव कर्म्मपुरुष-श्चिकित्साधिकृतः ।

"The Science of Medicine does not lay down that the self-conscious selves (क्षेत्रज्ञाः) are all-pervading, but on the contrary, it asserts that they are real and eternal and are born in the planes of divine, human, or animal existence according to their good or evil deeds in life. The existence of these self-conscious entities can be ascertained in as much as they are extremly subtle in their esse nce. The self-conscious is possessed of infinite consciousness, is real and eternally subject to the process of being evolved out into a finite organic individual through the dynamics of the combined sperm and ovum. The view is further corroborated by a dictum of Sruti which holds Purusha (individual) is nothing but a combination of a self and five kinds of matter formed into an organic body. This Purusha or individual, which is called individual of action (Karma Purusha) falls within the scope of the science and art of medicine."

K.L. Bhishagratna appends the following note to the above:– "Here lies the difference between Sankhya and Ayurveda. While the former discourses on immaterial character of the soul, the latter commences to discuss on the questions how the material environment in which the soul is said to inhabit is evolved, and how the inclusion of the spiritual within the material organism is effected.

"Hence Sushruta's Physiology, like that of Charaka is in the strictest sense of the word molecular and his science of life is an attempt at explanation of consciousness from the materialistic standpoint, which agrees with the views of the modern Western science. Intellect according to Sushruta is material and belongs to the same category which the Sankhya system of philosophy in its explanation of evolution enumerates originally as seven. The soul, according to Sushruta, is an independent existence and is often associated with what is called life. Where there is life, there is a soul and it is not everywhere the same. The soul in Sushruta, is individual (रशिजपुरुष) and takes cognisance of sorrow, disease and death by its union with the body (पश्चमहाभूतशरीरिसमवाय: पुरूष इत्युच्यन्ते). Hence the living frame together with the soul that is said to inhabit it forms the subject of Ayurvedic treatment."

THE TRIDOSHA THEORY

We now come to another cardinal point in the structure of the system of Ayurveda, the theory of *Tridosha or Vayu Pitta, and Kapha.* This theory forms the pivot, so to say, on which the science of Ayurveda revolves. The study of *Tridosha* is as important as it is interesting; for in the first place, it is the fundamental basis of all Ayurvedic treatment and pathology, and secondly, it has held its sway over almost all the earlier important medical systems, notably Greek and Arabic. There is yet another reason to attempt an explanation of *Tridosha*, and that is the hopelessly misleading interpretation by certain scholars, of the terms *Vayu, Pitta, and Kapha.* The works of modern Indian Ayurvedists go a long way to prove the erroneous nature of these translations,

and though, in certain cases, explanations, have been attempted from different points of view, there is no clash of opinion, as the fundamental conception remains, to a large extent, the same. A few remarks, however, on the origin and growth of the so called Humoral theory may be given before attempting an explanation of the terms *Vata, Pitta and Kapha.*

It has already been illustrated by a quotation from Rigveda (see Chap. III) that the theory of *Tridosha* was known to Indians at a very early date. Its occurrence in the Vedic literature proves its origin in India. Jolly has drawn attention to such medical terms in Atharva Veda as are connected with the *Tridosha.* The terms like '*Vatikrita*' (a disease caused by the derangement of Vayu) and '*Vatagulmin*', could not be written without the knowledge of the Tridosha theory. Dr. Ray in his *Hindu Chemistry* supplies the following two examples out of many from the chapter on Medicaments in *Mahavagga,* to prove the acquaintance of the early Buddhists with the Tridosha theory.

1. "Now at that time a certain Bhikshu had a superfluity of humours in his body." *Vinaya Texts pt. II p. 60.*

2. "And the blessed one said to the venerable Ananda: 'A disturbance, Ananda, has befallen the humours of the Thathagata's body." – Ibid p. 191.

"Nobody has yet been bold enough," says Dr. Ray, "to suggest that in the *Mahavagga* Greek influence can be traced." It may therefore be stated for good that the theory of *Tridosha* originated in India independent of any foreign influence.

THE HUMORAL THEORY OF THE GREEKS

The conception of the four humours of the body as described by the Greek is undoubtedly a reflection of the *Tridosha* theory. The fact is very probable if not certain, for the origin of the theory in India and the constant visits of the Greek physicians to India – a historically established fact – go to prove that there must have been some exchange of thought on this vitally important factor of both the Indian and the Greek medicine. That the flow of knowledge was from India towards Greece is also almost certain (vide chapters I & II); and this goes far to prove that the Greeks must have borrowed the conception of their 'humours' from Ayurvedic physicians especially when we find the mention of 'त्रिधातु' as early as the Rigvedic period in India. The description of the four humours of the Arabs is almost identical with those of the Greek medicine, which is the probable source of their Humoral pathology. We may be certain therefore that the conception of *Tridosha* is indigenous to India alone.

The conclusion that the Greeks are indebted to Indians for their Humoral theory is based, in addition to other important factors, on the analogy, observed, and generally accepted, between the Indian theory of the three *Doshas* and the Greek one of the four humours. Doubts have been raised, however as to the validity of the claim of this analogy by certain scholars, notably by Dr. P.C. Ray, who states, "After all, we are afraid, too much has been made of the resemblance between the Greek and Hindu theory and practice of medicine. The analogy is more superficial than real, and does not seem to bear a close examination. The Hindu system is based upon the three humours of the air, bile, and phlegm, that of the Greek is founded upon four humours, the blood,

the bile, the water, and the phlegm – a cardinal point of difference." The difference pointed out by Dr. Ray deserves a most careful consideration, for not only the difference of one humour in a small number of three is great, but the difference between the so called 'air' of the Indian theory and the 'water' of the Greeks is in itself considerable.

The difference is very conspicuous at the first glance. It is soon explained however, by a closer examination of the facts. It would be shortly explained that the three *doshas* of the Ayurvedic system have very little to do with the theory of the humors and cannot be represented by the terms wind', bile' and phlegm' in the least. They are the most scientifically concieved principles of the human body, and require a considerable study of the Ayurvedic science for their right conception. The conception of *Vayu* (omitted by the Greeks) especially, is the most complicated and difficult and has often proved a stumbling block to the foreign scholar. Hippokrates, after a partially successful interpretation of the *Pitta and Kapha* into Bile and phlegm seems to have been confronted by insurmountable difficulty in attempting an intelligible exposition of Vayu, and abandoning it altogether he substituted his own theory of water'. Hippocrates (Fifth century B.C.) must have gleaned his information from the Compendium of Sushruta (Sixth century B.C.) who was the first Ayurvedic exponent to mention 'blood' as an additional constituent of the important group of the *Doshas*. There is little wonder that the Greek author retained 'blood' as the fourth humour following the lines of Sushruta.[1] A close study

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[1] 'Be it observed that among the humours of Hippocrates there is no place for *Vata*, although in point of fact both his Physiology and Pathology are to be traced to the *Tridhatu* of Ayurveda. The secret of

of the text, however, will show that Sushruta does not accept 'blood' as a *dosha* in the strictest sense of the word. The misunderstanding arises from the fact that Sushruta, just a the beginning of his treatise enumerates blood as a *dosha*:–

"Diseases due to irregularities in food or drink, or incidentical to a deranged state of *Vata, Pitta, Kapha and Shonita* (blood) are called *Sharira,"– Sushruta, Sutra*, I.

This is followed by dissertations and practical hints on surgery. Latter on, when diseases requiring other than surgical treatment are mentioned. *Shonita* (blood) is dropped from the category of the *doshas* and the *Vata, Pitta and Kapha* only retained :–

सर्वेषञ्च व्याधीनां वातपित्तश्लेष्माण एव मूलम् ।

"The *Vata, Pitta and Kapha* are the exclusive cause of all the diseases." -*Sutra*, Chapter XXIV.

This apparent inconsistency in the text has been observed and explained by many writers on the subject. Kaviraj Yogindra Nath Sen, in his admirable *Upaskara*, commenting upon (वायुः पित्तं कफश्लोक्तः शरीरो दोषसंग्रः) writes :–

" ननु शोणितमपि दोषवर्गें पठ्यते । तथा च सुश्रुतः- शरीरास्त्वन्नपानमूला । वातपित्तकफशोणितसन्निपातवैषम्यनिमित्ताः । इति । तत्कथमिह शोणितं

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this anomaly is that the theory of Vata was found to be complicated one, and Hippocrates, not being able to comprehend its original import, left it out and cautiously introduced, in its stead, his own theory of 'water'. Some find 'Humoral Pathology' is not of Indian origin: neither it is the same which Indian *Rishis* of Rigveda developed under the name of *Tridhatu*. It is simply an imitation of Sushruta who introduced 'blood' as the fourth factor in the genesis of the disease. But the borrower, in the interpretation of Sushruta, has made a mess of it. He retained blood, but substituted 'water' in place of Vata, the most important of the three, for reasons best known to him." - K. L. Bhishagratna.

नोपात्तम् ? उच्यते । तत्र शल्याङ्गं प्रधानं । शल्याङ्गे प्रधानभूतो व्रणः । व्रणे च दूष्येषु मध्ये शोणितं प्रधानमिति शोणितोपादानं । वस्तुतस्तु त्रय एव शरीरदोषाः वातपित्तश्लेष्माणः । तत्रैव व्याधिसमुद्देशीये - सर्वेषां च व्याधीनां वातपित्तश्लेष्माण एव मूलं तल्लिङ्गत्वाद दृष्टफलत्वादागमाच्च । यथा हि कृत्स्नं विकारजातं विश्वरूपेणावस्थितं सत्वरजस्तमांसि न व्यतिरिच्यते । एवमेव कृत्स्नं विकारजातं विश्वरूपेणावस्थितमव्यतिरिच्य वातपित्तश्लेष्माणो वर्तन्ते । इति । रसजोऽयं व्याधिः रक्तजोऽयं व्यधिरित्यादिव्यपदेशस्तु उपचारात् । घृतदग्धवत् ।

The blood has also been read in the category of the *Doshas*, e.g. Sushruta writes: "Diseases due to irregularities in food or drink or incidental to a deranged state of *Vata, Pitta and Kapha, and Shonita* (blood) are called *Sharira.*" Why then, has not the 'blood' been mentioned here ? The reason is this: The diseases treated in that portion are mainly surgical. The main treatment in surgical cases is that of wounds of all kinds. Now the main (दूष्य) (that which is effected by a *dosha*) in such cases is the blood, therefore it has been temporarily mentioned (for convenience). In fact there are only three doshas – *Vat, Pitta and Shleshma*, as Sushruta himself declares when treating of the diseases in general:- "The deranged *Vayu, Pitta and Kapha*, should be looked upon as the primary sources of all diseases, in as much as symptoms characteristic of each of them may be detected in the case of a disease of whatsoever type (which abates with their corresponding subsidence), and also because the *Shastras* have ascribed to them the fatherhood of all maladies that assail the human frame. As the qualities of *Sattva, Rajas and Tamas* are inherent in, and inseparable from, all the phenomenal appearances in the universe, which are, in reality, but modifications of their own qualities, so the three fundamental bodily *doshas* underlie at the root of, and

run through the courses of all known forms of bodily distemper." The terms like *Rasaja-vyadhi* (a disease born of *Rasa*) and *Raktaja-vyadhi* (a blood-disease) etc., are only used for practical purposes of treatment, just as a part burnt by hot ghee is called for convenience (घृतद.ध) 'burnt by ghee', though it has in reality been burnt by the transformed heat of the fire." It is to the fire therefore that the quality of burning should be ascribed, as not to the ghee, which has served only as a medium for the fire to burn that particular part of the body. Similarly the ultimate cause of the disease lies in the derangement of the three primary doshas, *Vata, Pitta and Kapha* only, and cannot be ascribed to blood, chyle, bone, marrow, etc., which are only the seats of the *doshas*. This view is generally accepted by all the ancient and modern Ayurvedists.[1]

THE TRUE SIGNIFICANCE OF THE DOSHAS

I have tried not to confuse the term 'humour' with the dosha as the former is extremely inadequate to convey the full sense of the latter, which is more scientific, though a bit more complicated of the two. Some foreign Scholars have misguided themselves by considering the two terms identical. It is this misconception that accounts for the uncalled for contemptuous and unhealthy criticisms levelled against Ayurveda by certain writers, mostly foreign. The *Tridosha* theory of the Ayurvedists has very little to do with the 'old exploded humoral theory' of the Greeks. If the early Greek

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1. Charaka, Vagbhata, Chakrapanidutta, etc. all subscribe to this view. Among modern writers it has been clearly proved by Gangadhar Kaviraj in his जल्पकल्पतरू : Kaviraj Yogindra Nath Sen in this उपस्कारः and Vaidyaratna Ram Prasad in his आयुर्वेदसूत्रम्.

interpreters failed to understand the true significance of the *Tridosha*, there is no reason why the science of Ayurveda should be condemned.

Vata, Pitta and Kapha, are not 'wind bile and phlegm' as understood by some enterprising students of Ayurveda, but the three primary principles controlling the entire functions of the human body, comprising on one side the bio-motor force, the metabolic activity, and the preservative principle of the body, and forming the vehicles of the qualities of the *Rajas, Sattva, and Tamas* in the living organism on the other. The difficulty in attempting a perfectly intelligible translation of the *Tridosha* lies in the fact that there is an inseparable blending, however judicious, of two entirely different phenomena of organic life – of the physical with the metaphysical, and of the physiological with the psychological. After a closer examination, however, the line of demarcation may be discerned and the difference traced and explained. This has been lately attempted by many authors chiefly Indian. The physical and the metaphysical aspects of the *Tridosha* have now been successfully analysed. I shall first take up the physical and the physiological aspects of *Tridosha* as viewed by some leading Ayurvedists. Kaviraj Gananath Sen explains the *Tridosha* theory in the following words : –

"The Ayurvedic physician believes that all physiological functions are controlled by three principles. One is the motive or dynamic principle – the principle of motion and multiplication.. It is born with the first cell, which when impregnated, begins to divide and become gradually organised through what turns out to be an inherent force. This

force is known as *Vayu or Baya* (cf. *Bios* - Greek meaning 'life') - the vital force or cell-force.

"It differentiates the cells into different structures. It creates blood-vessels, lymphatics and nerves and pervades a complex organism. The inherent force manifests itself later in higher evolutions as nerve structures as nerve-force."

"But this nerve-force is not the sole connotation of *Vayu* as some people understand. It is a differentiated and more crystallised from, as it were, of *Vayu*. But the original meaning of *Vayu* is not nerve-force, but cell-force.

"A man for instance, grows a tumour. It becomes gradually organised. Blood-vessels grow into it. Nerves spread in it, Gradually, if it comes in contact with hard substance, a horny growth takes pace on it. What guides all these ? It is this cell-force, or rather, correlated cell-force or vital force. It is *Vayu*.. Hence *Vayu* is not wind or gas as some people suppose. The true conception of *Vayu* is not incompatible with any of the teachings of the modern physiology.

"I now come to *Pitta* - the second principle. It is a principle that generates and keeps up the heat of the body. It manifests itself in different forms and different chemical activities mainly digestion and assimilation. It prepares the material to be absorbed and power to metabolise the nourishment that is absorbed into the human body.

"In one word it keeps up the equilibrium of heat and combustion. And, on the mental side, it is the principle that prepares the field for the perception of light stimuli. They say that, at the end of the retina, a chemical process takes place, by which the image is printed, for the time being, on the white

surface. In Western physiology is the photo-chemical substance - we call *Alochaka Pitta.*

"The metabolism that occurs in the skin and muscles is attributed to *Pitta.* In one word, you can take *Pitta* as guiding all the metabolic activities of the body. It is the sustaining fire as the ancients call it.

"I will next take up *Kapha or Shleshma*, the cooling or the preservative principle. It is said that just as there is the principle which keeps the fire burning, there is another principle which keeps up the coolness. This cooling principle acts like the water-jacket of the internal combustion engine. It keeps the body cool by giving normal secretions which are preservative.

"It always keep secreting a cooling or mucous membrane in the mouth, in the respiratory passages, in the eyes, in the stomach and in the joints. Wherever there is friction and wherever there is heat production, there is this principle manifesting itself in the secretion of preservative fluids. As there are several forms of crude *Pitta* like gastric juice, bile, and pancreatic juice, so also you will find this principle manifested in several crude and tangible forms."

This explanation is founded upon the clearest texts of the oldest treatises on Ayurveda, the compendia of *Charaka, Sushruta, and Vagbhata* and there is nothing that has been surreptitiously introduced. Charaka describes *Vayu* as a force that upholds the constituents of the body and determines their course through the body. It causes the senses to perform their functions. It holds together all the elements of the body, assisting cohesion of the particles of the human frame. It causes speech. It is the prime cause of touch and sound and

the root of scent and touch. It throws out all impurities. It gives form to the embryo in the womb. It furnishes evidence of the existence of life etc.[1]

Similarly, the metabolic principle of the body, the *Pitta*, performs the functions of digestion, aids the faculty of vision, and regulates the temperature. It represents so to say, the fire of the body (अग्निरेव शरीरे पित्तान्तर्गतः)

Kapha, represents *Soma*, or the principle of cooling and oily secretions and preservative functions when working in its normal state. It generates strength (दार्ढ्यं lit. tightness) of limbs, growth, courage, virility, etc. -*Charaka Sutra*, XII, 11-12.

The three processes of *Sanchalana* (सञ्चलन), *Swedana* (स्वेदन), *and Snehana* (स्नेहन), conducted by *Vata, Pitta and Kapha* respectively again illustrate the same point. Their very names support the above explanation. The point has been dwelt upon so much because the validity of the correctness of this interpretation was recently doubted by an allopathic practitioner in an assembly of indigenous practitioners at Amritsar. He was of opinion that this interpretation was coined to keep pace with the Western medicine, but the existence of such a theory in the Ayurvedic texts was very doubtful. The original text has therefore been quoted

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1 प्रवर्तकश्चेष्टानामुच्चावचानां... सर्वेन्द्रियाणामुद्योजकः सर्वेन्द्रियाणामभिवोढा, सर्वशरीरधातुव्यूहकरः सन्धानकरः शरीरस्य, प्रवर्तको वाच, प्रकृति स्पर्शशब्दादयोः श्रोत्रस्पर्शनयोर्मूलं, हर्षोत्साहयोर्योनिः समीरणोऽग्नेः दोष संशोषणः क्षेप्ता बहिर्मलानां, स्थूलाणुस्रोतसां भेत्ता, कर्ता गर्भाकृतीनां, आयुषोऽनुवृत्ति प्रत्ययभूतो भवत्यकुपितः।

चरक सूत्र, अ १२ सूत्र ८

throughout in order to remove any such misunderstanding on the part of the votaries of Western medicine.

Sanchalana (सञ्चालन): The process of *Sanchalana* (lit. regulating the movements of the living organism) is attributed to *Vayu*. *Sanchalana* may be interpreted as the process of motion and multiplication. This is carried on by *Vayu*, the most powerful of the triad of *Tridosha*, and the sole factor responsible for the process of segmentation and development of the organism from the first cell (पवनस्तेषु बलवान् विभागकरणान्मतः Sharangdhara.) It pervades the whole organism and helps the other two *Doshas; Pitta and Kapha*, in performing their regular functions. It also carries the manifest forms of *Pitta and Kapha* from one place to the other as they are inert in themselves (पित्तं, पङ्गु, कफः, पङ्गवो मलधातवः वायुना नीयन्ते etc. Sharangdhara). It is the dynamic principle of the body controlling and keeping in equilibrium the functions of the other *doshas*, *dhatus*, and other constituents of the body intact, and guides and represents all the correlative forces at work in the human machine. It expels from the body all the secretions like urine, faeces, perspiration etc., which, if retained, would prove harmful. In one word, it combines the motive, segmentative, differentiative and the correlative forces of the body into one homogeneous whole.

Svedana (स्वेदन) : The process of Svedana (lit. sweating or heating) is attributed to *Pitta* or the thermal constituent of the body. It manifests itself through thermal effects. It metabolises the tissues and nourishes the cells. It is *Pitta* that guides the process of pigmentation, helps digestion and assimilation of food, and controls the sudatory functions. It

gives form to the complexion. The *Ranjaka Pitta* converts *Rasa* into blood by imparting red colour to it. It is responsible for hunger, thirst, softness and suppleness of the body and formation of various secretions and excretions. It is the thermogenetic and the metabolic principle of the body.

Snehana (स्नेहन) : The process of Snehana or lubrication and preservation is conducted by *Kapha*. It secretes mucilaginous secretions to preserve the tissues from overaction of *Pitta*, which is 'hot', and *Vata*, which is 'dry' (रुक्ष). Its deterioration is marked by burning sensation and feeling of 'dryness' of limbs. It produces smooth working of joints, general stability and strong build of the body. It is so to say, a cooling, sustaining and preserving principle of the living organism.

THE TRIDOSHA AND THE SYMPATHETIC ENDOCRINOLOGY

A comparison, at this stage, between the ancient theory of *Tridosha* and the modern theory of Sympathetic Endocrinology may be attempted to some purpose, as the analogy between the two theories is striking from many points of view:–

In both the theories there is a blending of the physical with the metaphysical the physiological with the psychological aspects, the only difference being this that the Ayurvedists are clear and elaborate on this point, whereas the Endocrinologists have only begun to get a glimpse of it. This would be clear from the following extracts from the writings of two famous Endocrinologists:–

"To unravel the intricate and esoteric mysteries of the glands of internal secretions, which deal with the secrets of life itself, *there is danger of drifting into the metaphysical.*' Leonard Williams.

"When we come to the consideration of the glands of the internal secretion, we are on different grounds altogether, *almost on holy grounds, for here we are dealing with the inner secrets of life itself* " - T. Bradley Scott.

We also find in the modern theory of Sympathetic endocrinology a blending of 'Philosophy, science, and Religion' similar to Ayurveda, and Captain Murti has rightly observed that some of the 'master minds of modern Western medicine are turning their attention to the reasons which appear so Ayurvedic.' "

Again, Frindenburg (Barker's *Endocrinology Metabolism*), another Endocrinologist, states that "there is an endocrine factor not only in health and ill-health, in diet and drug, but in heat and cold, rest and exercise, sleep and waking sun and shade, in fact *all nature's telluric influences act on and by the complicated systems of glands of internal secretion.* How else can we attempt to explain the systematic effects of such influences as wind, weather, altitude, climate seasonal incidence, geographical distribution of diseases, etc."

One might feel that the above is a quotation from some elementary Ayurvedic text when we find that the diet, the hours of the day and the night, the seasons of the year, 'rest and exercise', 'sleep and waking', 'sun and shade', and even the various states of mind like that of jealousy, fear joy, anger etc. have been discovered to influence the three *doshas* and classified according to their relations to them. The Western

science has only lately begun to take into consideration the influence caused by the various states of mind on the general health.

Dr. Ashutosh Roy, whose erudite article on this subject[1] tempted me to include Endocrinology in this treatise. States:-

"Another point of analogy between the two theories, is that both consider health and ill-health from the point of view of the 'soil' giving the 'seed' a secondary importance...... Hindu physicians describe the action of drugs from the sympathetic Endocrine point of view, so forcibly brought forward by Sajous, the pioneer American endocrinologist, when he says that 'Pharmaco-Endocrinology' will reveal the importance of drugs as weapons against disease. Hindu physicians classify disease from the view-point of 'soil' which is the same as sympathetic Endocrinology....

"Finally the fact that Hindu physicians have associated *their 'Tridosha theory'* with telluric influence and personal factors of the individual are additional proofs of the closest analogy... The *Pitta* and *Kapha* are the keys to unlock the mysteries of opposing yet complementary glands of internal secretion....

"If, therefore, the *Tridosha* theory of Ayurveda bears an analogy to 'certain definite things in Western physiology,' what harm there is to state it clearly. How can such interpretations be considered as 'fanciful,' the 'desperate attempts' of some 'pro-Ayurvedists' to show that 'the teachings of Ayurveda square with the teachings of Western medicine. This analogy is unmistakably evident by comparative study.

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1. The Journal of Ayurveda Vol. II. Nos. 9.10

"On the other hand when one finds such close analogy between the oldest theory of ancient medicine and the latest theory of the modern medicine, one has every legitimate reason to be proud of the fact that the modern Western medicine with the boast of scientific basis is slowly but surely drifting towards the view of our forefathers who developed the same idea of health and disease several centuries ago."

OTHER ASPECTS OF TRIDOSHA

In its metaphysical aspect the *Tridosha* theory forms the physical counterpart of *Sattva, Rajas, and Tamas* of the body. Sushruta says that *Vata, Pitta and Kapha* are to the body what *Sattva, Rajas and Tamas* are to the Universe. The significance of the three *gunas* has been made clear at the beginning of the chapter. In their material aspect, the *Vayu*, is derived from ether and air substance (आकाश and वायु) *Pitta* from fire (तेज) and *Kapha* from water and earth substance (अप् and पृथिवी) It may however, be understood that whatever be the different aspects of the three *doshas* there is no basic inconsistency throughout. The conception is complete and scientific. No one explanation contradicts the other, but whether the *Tridosha* are energies, forces, principles, humors, or hormones (in their different forms and manifestations), their physiological and pathological significance remains the same. The facts as presented by the Ayurvedic texts clearly denote that the ancients never considered the *doshas* as effete materials like tangible forms of *Kapha* and *Pitta*, or the gases produced in stomach in the process of digestion. The following verse from *Shri Shiva Tattva Ratnakara* proves that the old idea of the three *doshas* had a broader conception of their meaning than understood by the Western Scholars :–

नराणामिव वृक्षाणां वातपित्तकफाः गदाः ।
संभवन्ति यतस्तस्मात्कुर्य्यात्तद्दोषनाशनम् ।।

"The trees also, like men, get diseases due to the derangement of (their vital, metabolic or preservative principles) *Vayu, Pitta and Kapha*, etc." [1]

Surely, the ancients did not discern any bile and phlegm in the trees! They evidently believed the three *doshas* to be some forms of energies or principles of the living organism.

TRIDOSHA AND BACTERIOLOGY

A word, in the end, to the votaries of the germ theory, lest they might feel ignored. Bacteriology, has been constructed on a sound and scientific basis of observed and proven facts, and according to this theory the diseases are traced to the mischief of different forms of bacteria, as their root cause. The theory has found almost a universal support, and has been accepted by some as the last step in the problem of tracing the origin of the disease. What place, then, can be assigned to *Tridosha* Pathology in the realm of science, if this be true? Shall we attribute the cause of the disease to the bacteria or to the three primal constituents of the body, *Vata, Pitta Kapha ?* Does our search after truth endanger the

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1 कृशो दीर्घो लघू रूक्षो निद्राहीनोऽल्पचेतनः ।
न धत्ते फलपुष्पाणि वातप्रकृतिकणस्तरूः ।।
आतपासहनः पाण्डुश्शाखाहीनो मुहर्यदि ।
अकालपाकः स्याच्छाखी स तु पित्तात्मकः कृशः ।।
सिद्धान्तशाखादलश्शाखी सम्यक् पुष्पफलोऽज्वलः ।
लतापरीतगात्रस्तु कफवान् परिमण्डलः ।।

stability of any of the two theories ? If so, which of the two would stand the test of the scientist ?

The answer is simple, and not far to seek. There is danger to neither, for the one supports the other. So far as the main facts are concerned there is not the slightest divergence between the two. On the other hand – the statement may not alarm the Western doctors – the germ theory, if it continues to develop in the right direction, may some day, be identified with the *Tridosha* theory of the ancients!

Bacteriologists, as has already been stated, believe certain micro-organisms or bacteria to be the root cause of disease. Such micro-organisms, however were not unknown to the ancients. The difficulty is raised in many places by the use of the word 'krimi' (कृमि) for these micro-organisms, for, the terms is generally supposed to mean higher forms of insects and worms etc. A close examination of the Ayurvedic texts however, banished this misconception. *Vagbhata* (2nd Century B.C. – Kunte), for instance, displays in no uncertain terms, his knowledge of bacteria in the following verse:–

जन्तवोऽणवः ।

अपादा वृत्तताम्राश्च सौक्ष्मयात्केचिददर्शनाः ।

These organisms are unicellular (अणु) round and without limbs (वृत्त, अपाद), and invisible to the naked eye due to their highly minute structure (सौक्ष्म्याददर्शनाः)- *Ashtanghridya, Nidana.* XIV, 51.

Charaka mentions minute organisms which are invisible to the eye (सूक्ष्मत्वाच्चैके भवन्त्यदृश्याः) Surely these are not the worms or the insects, into which the sense of the term *krimi*

said to be restricted. It may be so elsewhere but in the realm of Ayurveda, the old texts clearly indicate that the word was used in a broader sense than is today attributed to it. These micro-organisms were differentiated from higher forms by the term *Anu* अणु or *Kitanu* कीटाणु as the modern Ayurvedists call them. Although these *Anus* were known to be the cause of disease as is also believed by the modern scientists, they were not regarded as the root cause of the disease. The presence of these

micro-organisms was ascribed to a still further cause – the three primal factors of the disease, the *doshas*, *which in the state*

of derangement would give birth to innumerable forms (असंख्याः) *of these micro-organisms which are the secondary cause of the disease*. An Ayurverdist would treat them along with the disease as symptoms or manifestations of those radical and essential forces, which in their deranged state, are at the root of all human ailments.

Take for example, the case of malarial fever. The Bacteriologist believes that a certain form of bacteria, the malarial parasite, is the root cause of this disease. An Ayurvedist who knows that the fever is due to the abnormal influence of *Pitta,* treats the case with the *Pittaghna Dravyas* (पित्तघ्न द्रव्य anti-*Paittic* drugs), For this purpose he chooses the तिक्त (bitter) or कअषाय (astringent), or other *Pitta*-reducing drugs for malarial treatment. Even this is not prescribed like the Western doctor, who has been taught to kill the malarial parasites with increasing doses of quinine. The statutes of Ayurveda do not permit the practitioner to organise a wild chase after the parasites under all circumstances. He is to

administer his medicine with due regard to place, time, strength, age, etc. (देश, काल, बल, वय, इत्यादि) of the patient. Both the Allopath and the Ayurvedist have their systems of treatment, with the difference that the Ayurvedist can easily and successfully classify all the diseases under the three primary forces, and treat them with equal ease and success, whereas the Western doctor still gropes in the dark in various diseases, whose germs he has not yet been able to discover. He may discover them one day. He may go still further and find that those germs are product not of nothing but of certain positive forces, which can be inferred with the aid of experiment and reason only but cannot be sensed physically even with the aid of the finest microscope in the world. For how can a foreign organism take its birth in our body unless there be some pre-existent factor of the body at the root of it ? If it is supposed that the germ only enters the body and is not born therein, what are those factors which are responsible for the immunity (वैष्णवी शक्ति) ? Why does a particular individual catch the infection and not the other. Even the (immunity) is a state, according to the Ayurvedist, under which the collocation of the three *doshas* is more desirable and healthy.

It may be objected here that if the *doshas* are the real cause of the disease, why does the advent of the parasite affect the health. They should be considered the primary cause in the infectious diseases at least. This, however, is not the view of the Ayurvedist. The diseases in Ayurveda belong mainly to two orders–*Nija* and *Agantuja*. The *Nija* (निज) or the diseases arising (within the human body) from improper diet, practices etc., have for their cause, the disturbance of the dosha-equilibrium (दोष वैषम्य) which is the immediate result of

improper diet etc. The *Agantuja* (आगन्तुज) or adventitious diseases, which include snake-bites, hurts, shocks, etc., have of course, some external factor for their cause. Infectious diseases (संक्रामक रोग) however, though regarded as adventitious by Ayurveda, have, in fact, again, the disturbance of the *dosha*-equilibrium for their cause. In the above instance of malaria the process of the advent of the disease is explained thus: The three *doshas* of the disease is explained thus: The three *doshas* of the patient are disturbed by improper diet, wrong actions etc. (कालार्थकम्मर्णा हीनमिथ्यातियोगाः) before the patient catches the infection. If the *doshas* are in perfect equilibrium, the body is immune and as long as this state lasts no amount of infection can affect the health. But if the *Pitta* is already in an excitable state (due to मिथ्याहार etc.), though apparently not excited, or very slightly excited, the advent of the infectious disease (रोगसंक्रमण), provided it is *Pitta* increasing in nature, such as malaria, will at once affect the patient, and the result will be a *Paittic* (पैत्तिक) disease. Even in this case the root cause is the original disturbance of the *doshas* for otherwise the body-being in a state of immunity–could not have been affected by the infectious disease. Immunity in other words is nothing but *dosha*-equilibrium (दोषसाम्यरोगिता) and the loss of immunity (दोष वैषम्य) and not the bacteria is the root-cause of the disease according to the Ayurvedist. When the immunity or dosha-equilibrium is restored in malarial fever with *Pitta* reducing drugs the potency of the parasite is annihilated and the fever disappears.

It may be noted here that the malarial fever is mentioned by the old Ayurvedic writers in the *Santata* (सन्तत) fevers. This classification is significant. The word *Santata* means that which recurs when the offspring is let loose (सन्तत्या विसर्गः) i.e. this adventitious disease recurs as the successive generations of the parasites are let loose into the blood. This again shows that the ancients were acquainted with the modern germ theory but considered it proper not to call germs the root cause of the disease.

Even the epidemics are the result of the loss of equilibrium of the universal counterparts of the human *doshas* the *Vayu, Agni and Soma*, or, to go still further, the three metaphysical forces of the universe, the *Rajas, Sattva, and Tamas*. It is not ambiguous therefore to state according to the Ayurvedic principles, that the germs are a product of the derangement of the *Doshas*.

When the Western scientist is led therefore, by fact and observation to a belief that there may be some other factor at the bottom of the germs, and that they are not in themselves the root cause of the disease, he may experiment upon these germs and find out that certain types of these different bacteria possess familiar characteristics, and that one large order of these different classes of bacteria responds to one sort of treatment, and the other order to the other. As his knowledge advances he may group the sub-classes of these germs of different diseases into three big orders, germs of diseases born of the derangement of 1. *Vayu, 2. Pitta, and 3. Kapha, or* X, Y, and Z, (as he may choose) which three factors in their normal state represent what is called the *Vaishnavi Shakti*, or the immunity.

When this state is reached the long and inexhaustible labours of the Intellect are repaid by a reward to the Memory, which is no longer overtaxed by the confusion of innumerable names of a thousand and one bacteria of a thousand and one types of disease for the true and practical purpose of the science has been achieved in the discovery of the primary factors of the disease.

But this is a long process of development in the right direction and perhaps the Western scientist with his big name and all the boast of state patronage, may still remain constant to his scientific superstition, if the line of investigation is drawn some other way. There is yet another important factor before the Western scientists to help them in the realisation of the fact that they are approaching the *Tridosha* theory unawares even at the present day. They have almost completed their quest after truth. The germ theory is incomplete in so far as there is a large number of diseases which have not yet surrendered to the investigation of the germ-seekers. The theory therefore cannot be pronounced complete unless the germs of at least the majority of the diseases are discovered. The theory of sympathetic Endocrinology on the other hand, has also had a partial development. As both these theories are an attempt in a similar direction, i.e. to discover the nature of the true cause of health and ill-health, they might present a stage in their development where one might prove analogous to the other, their functions in this respect being the same. This analogy, if ever discovered, would lead to an amalgamation of the two theories into one – the *Tridosha* theory ! For what would be the compromise between the two ? Evidently this, that the mysterious secretions of the Endocrine glands, either *invite* or

give rise to, in the state of ill-health, certain micro-organisms, the bacteria, which are now no longer regarded as the primary cause of the disease, but the place assigned to them in the genesis of the disease is the same as given by the *Tridosha* theory. There is nothing bold or astounding, therefore, in the statement, that the germ theory and the theory of sympathetic Endocrinology are the *Tridosha* theory in the making. In fact, it may be asserted with confidence, that the *Tridosha* as it is today and as it has ever been, is a genuine combination of the two Western theories in their most salient features.

CHAPTER VI

THE FUNDAMENTAL PRINCIPLES OF AYURVEDA - II

If the physicians of the present day would drop from the pharmacopoeia all the modern drugs and chemicals, and treat their patients according to the methods of Charaka, there would be less work for the undertakers and fewer chronic invalids in the world.

G. E. Clarke, M.A..,M.D.

We have dealt with, in the previous chapter with the two most important constituents of the system of Ayurveda–the theories of evolution and *Tridosha*. The first explains the origin of the man and the universe and their relation to each other, the second describes the physiological and the pathological conditions of the living organism. Both explain in their own ways the composition of the organism. The former describes its penta-*Bhautic* nature i.e. the formation from *Akasha, Vayu, Tejas, Ap,* and *Prithivi* (Ether -, Air-, Fire-, and Earth-substances) the latter explains the influence of the three forces of *Vata, Pitta* and *Kapha* on the human in their various abstract and concrete forms.

Both these theories describe only the subtle factors of the body, and exclude the grosser constituents. We now come to the third great division of Ayurveda–that of the *Dhatus* or the grosser constituents of the body. The word *dhatu* (धातु) is derived from the root धृञ् which means to hold or to bear. These are called *dhatus* because they bear, so to say, the whole body (देहधारणाद्धातवः). These are: रस (fluids like chyle

etc.). रक्त (blood), मान्स (flesh), मेद (fat), अस्थि (bone), मज्जा (marrow), and शुक्र (the vital seed). The seven *dhatus* grow more and more complex as we proceed from the first to the last, and the copious and healthy quantity of the first *dhatu* will help the formation of the other, and so on. (रसाद्रक्तं, ततो मांसं, मांसान्मेदः प्रजायते, मेदसोऽस्थि etc.) All these *dhatus* are penta-*Bhautic in* origin and subject to health and ill health at the instance of *Vayu, Pitta* and *Kapha*. These are also *dushyas* (दुष्याः) i.e. those that are affected by a *dosha.* These form the field, so to say, on which the forces of *Vata, Pitta,* and *Kapha* work.

It is a *dhatu* that catches the infection and it is a *dhatu* that is immune to all diseases. These are the sole visible constituents of the body with the exception of *Malas* (मला) or excretions, like urine, faecal matter, perspiration, tarter, sputum, impurities of the eye, ear and nose; etc. which are also penta-*Bhautic* in composition and subject to the dynamics of *Tridosha.*

The *Karma Purusha* (कर्म पुरुष) then, is an aggregate of the individual soul, the three *doshas*, and several *Malas*. It may be observed here that with the exception of the soul, all these constituents of the body are different combinations of the five primary *Bhutas.*

This *Karma Purusha* is subject to various ailments, and to free him of his disease is the object of the science of Ayurveda. The term disease, (व्याधि), however, implies a broader meaning in the Ayurvedic than in the Western sense of the word. *Vyadhi* or disease is defined by Sushruta as

तत् (कर्म्मपुरुष) -दुःखसंयोगा व्याधये उच्यन्ते।

"Anything that proves a source of pain to Man is disease"

Sushruta, Sutra. 1,22.

These diseases are grouped under four heads, *Agantuka* (आगन्तुक), *Shariraka* (शारीरक), *Manasika* (मानसिक), and *Svabhavika* (स्वाभाविक). These may be translated as Adventitious, Physical, Mental and Natural.

ADVENTITIOUS DISEASE (आगन्तुक व्याधि)

The adventitious diseases are to begin with, the result of an external cause. A man, for instance, bitten by a snake, mad dog, or a scorpion etc., wounded by an arrow, hurt or bruised by a fall, stung by a wasp, is said to be suffering from an adventitious disease. Acts of violence, binding, pressure, burns and all sorts of bites and accidental diseases are adventitious. After an adventitious disease finds a seat in the human body, it begins to adapt itself according to the order the order of the *doshas*. A wound, thus may be वातप्रकृति, पित्तप्रकृति, or कफप्रकृति, i.e. it may exhibit the nature of the excess of the influence of *Vata, Pitta,* or *Kapha* on that particular spot according to the collocation of the *doshas* in that particular area (दोषसंस्थानभेद). Similarly an infectious disease (संक्रामक रोग) will adapt itself according to the nature of the doshas, and the particular dosha, which helps and is helped in turn by that specific variety of disease to manifest itself in an abnormal form, will respond to the treatment, which aims not at the prevention of the disease, for now the disease has already invaded the body, but at the prevention of the disease from mixing with the predominant dosha of the affected area (तत्रस्थ दोष). Strictly speaking even this treatment does not overlook the principles of *Tridosha* altogether, but the main

treatment consists in healing and safeguarding the *dushya* (the affected constituent of the body) rather than controlling the abnormal activity of the *doshas* by bringing them into a state of equilibrium according to the following direction :–

आगन्तुकं दोषं तत्रस्थमेवोपक्रामेत, यथा चाऽऽगन्तुको विकारः शरीरे न प्रसरेत्तया तं पूर्वं तत्रस्थमेवजयेत् ।

'The adventitious diseases should be cured on the spot. They should be cured immediately so that they may not spread in the body.' - *Ayurveda Sutra, III, 5.*

The spreading of a disease, of course depends upon the nature of that disease. Malarial fever and a bite by a dog are both adventitious diseases, yet the former excites the particular *dosha* soon after the advent of the parasite, and the latter if controlled in time, maybe cured without disturbing, to an appreciable extent, the *Dosha-samya* (दोष साम्य) or the *equilibrium* of the *doshas*. Snake-bite is a drastic case, and would exhibit comparatively more perceptible derangement of *Vayu* even at the very outset, but a wasp-sting, a wound from an arrow-shaft, a fracture of the bone, etc., can be healed up before they stir up and mix with any particular *dosha* begin to spread the infection. The treatment in general is like the treatment of the physical (शारीरक) diseases, according to the nature of the disease. Epidemics like plague (मौषिक जनपदोद्धंसन) are included in the *Agantuka* division.

PHYSICAL DISEASE (शारीरक व्याधि)

Next we come to the second large order of the human ailments, the *Shariraka* or the Physical diseases. These are defined as follows:

शारीरास्त्वाहारविहारमूला वातपित्तकफवैषम्यनिमित्ता: ।

"Diseases due to the derangement of *Vayu*, *Pitta*, or *Kapha*, resulting from improper food and mode of living (विहार) are called Sharira." - *Ayurveda Sutra* II. 3.

This large division includes the vast and limitless classification of all sorts of physical ailments like fevers, dysentery, noemoptysis, insanity, hysteria, disorders of the urino-genital tract, the effects of excessive smoking and drinking, effects of cold, heat, and other environments, etc. etc. to an endless series. Though it is hardly possible to point out a disease that has gone unobserved by the ancient Indian physicians, there are no limits raised to the possibility of another type of disease. Charaka asserts that even a single disease assumes as many forms as the individuals suffering from it, however slight the difference may be :

विकारा: पुनरपरिसंख्येया: प्रकृत्यधिष्ठानलिङ्गायतन

विकल्पविशेषात्तेषामपरिसंख्येयत्वात् ।

"The number of diseases is infinite in consequence of their varied nature, seat, symptoms, area and variety, etc., which are in themselves innumerable." *Charaka Sutra*, XX, 4.

Again,

त एवापरिसंख्यया भिद्यमाना भवन्ति हि ।

रूजावर्णसमुत्थानस्थानसंस्थाननामभि: ।।

"These are divisible into countless forms according to the varied nature of their pain, colour, cause, area, etc." *Charaka Sutra* XVIII, 48

The disease may, again assume different forms according to *dosha, dushya*, time (the difference of seasons etc.) place (marshy grounds, hills, forests, green dry, healthy or unhealthy tracts etc.) age, strength, etc. All factors affecting the health, affect the disease should be throughly analysed, and all factors bearing upon it should be separately noticed from different viewpoints. He stresses the point that there is no contradiction if the two divisions of a disease differ, provided their sense is not contradictory.[1]

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[1] न च संख्येयाग्रेषु भेदप्रकृत्यन्तरीयेषु विगीतिरित्यतो दोषवती स्यादत्र काचित्प्रतिज्ञा, न चाविगीतिरित्यत: स्याददोषवती ।

"When the diseases, liable to division, are divided into more than one kind of different division according to the different nature of those divisions, the proposition cannot be held faulty owing to the (apparent) contradiction, as also it should not be supposed to be faultless owing to the (apparent) inconsistency." - *Charaka, Vimana.*

What is meant by the author would be clear from the following example :

All disease can be grouped under one name 'aliment' or 'that which is a source of pain,' in as much as all diseases prove a source of pain. The diseases, therefore are mainly divisible into one kind only. Again they have been divided into four heads, Adventitious, Physical etc. According to the latter division they are of four kinds. Charaka says that the two propositions one mentioning that the disease is of one kind and the other that it is divisible into four kinds, cannot be held contradictory as one does not contradict the sense of the other. Similarly if we unreasonably assert that even as a 'source of pain' the disease is of four kinds, the apparent consistency of the first and the second division cannot vouchsafe the faultlessness of the exposition, for, as a 'source of pain', the disease is only one and there is no division possible unless there as a disease which is not a source of pain. The analysis of the disease therefore, should be based on the correct divisions of the factors influencing the disease.

DIAGNOSIS

We know come to the diagnosis of a disease as expounded by the Ayurvedic writers. The correct diagnosis of a disease has been stressed upon as the most important factor in the Ayurveda clinics. The knowledge of the following diagnostic factors is essential for ascertaining a disease : *Nidana, Purvarupa, Linga, Upashaya, and Samprapti* (तस्योंपलब्धिर्निदानपूर्वरूपलिङ्गोपशय सम्प्रातित: *Charaka, Nidana* 1,5.)

Nidana is the cause of the disease (तत्र निदानं कारणम्- *Charaka*).

Purva-rupa implies the symptoms arising before the appearance of the disease (पूर्वरूपं प्रागुत्पत्तिलक्षणं व्याधे: - *Charaka Nidana, I,7*)

Linga implies the symptoms which are manifest on the appearance of the disease (प्रादुर्भूतलक्षणं लिङ्गं - *Ibid 7*).

Upashaya is just the reverse of the *Nidana* (cause) of the disease. Anything whatsoever that relieves or tends to relieve the patient of his suffering is *Upashaya*. The knowledge of *Upashaya* has a greater importance in the treatment of a disease rather than its ascertainment, but its value in diagnosing a disease cannot altogether be ignored. Take for instance two different diseases A and B resemble each other in their manifested symptoms so much that it is difficult to tell one from the other. But we know that diet and practices of a certain class have a soothing effect on A and an adverse effect on B disease. The patient when asked will describe his experience with the things that prove beneficial or harmful to his constitution, and from the properties of those things the

nature of the disease can be ascertained to a certain extent. The patient, however *is not to be experimented upon* by drugs in order to find out the nature of the disease.

The term *Upashaya* is not restricted to beneficial administration of medicine only. The science of Ayurveda has done full justice to this vast subject and only a bird's eye view of the subject can be presented in the short scope of this essay. The following aphorism which is also an interesting study from the point of view of the characteristic terseness of style of the ancient Indian writers, gives in brief the genera definition and classification of *Upashaya:*

Upashaya is the advantageous or happy (सुखानुबन्ध) : resulting in relief or happiness) administration (उपयोग - use) of the drugs (औषध), diet (अन्न) and practices and mode of living (विहार), *i.* contrary to the cause *ii.* contrary to the disease,, or *iii* contrary to both the cause and the disease, or *iv.* similar to the cause, *v.* similar to the disease, or *vi.* similar to both the cause and the disease, - *Charaka Nidana, 1.9*

This proves beyond doubt that the principle of Homeopathic treatment, *Similia Similibus Curantur*, was known to the ancients at an early date, as also they were fully acquainted with the law of the contraries of the Allopathic system of medicine. Each of the three great factors of *Upashaya,* Drug (including all animal vegetable and mineral preparations,) Diet (including drinks and foods of all sorts), and Practices (including all modes of living, climatic changes, fasts, the presence of soothing factors like, friends, women etc.) is divided into two categories of contrary and similar types of treatment. This makes six kinds of

Upashaya which again is subdivided into eighteen kinds by the action of each of the six forms *i.* exclusively upon the cause, *ii* exclusively upon the effect or *iii* on both the cause and the effect together. These eighteen orders may be tabulated thus :

$$U\left\{\begin{matrix}D_1\\ D_2\\ P\end{matrix}\right\}\text{ to be adminsitered }\left\{\begin{matrix}\text{c. C.}\\ \text{c. D.}\\ \text{c. C. \& D}\\ \text{s. C.}\\ \text{s. D}\\ \text{s. C. \& D.}\end{matrix}\right.$$

U-Upashaya. D_1-Drug, D_2-Diet, P-Practices, c-contrary to, s- similar to, C-Cause exclusively, D-Disease exclusively, D-Disease exclusively, C & D-cause and disease both.

SAMPRAPTI - (सम्प्राप्ति) *Samprapti* is the correct knowledge of the exact nature of the disease as to its seat, its mode of advent or taking its birth in the body, its principle course and different forms under which its manifests itself along with a through understanding of the various factors (अंशांशकल्पना) working together to produce a complex disease presenting a combination of different disorders at one and the same time. (एवं दुष्टेनैव (विसर्पता) एवं स्थानस्थितेनैवमनुगतेन इत्यादि प्रसारक्रमेण यद्रोगनिर्वृत्ति यथावद्रोगोत्पादनक्रमविज्ञानं सा आप्तिः संप्राप्तिः । *Ayurveda Sutra III, 1.*)

Samprapti is distinguished by

1. *Sankhya* (number)
2. *Vikalpa* (analysis)

3. *Pradhanya* (Predominance)
4. *Bala* (strength)
5. *Kala* (time)

Sankhya Samprapti represents the number of the forms of the disease e.g. seven kinds of leprosy etc.

Vikalpa Samprapti is the accurate analysis or differentiation of the relative action of the doshas, and other cause and effects, in a disease. The differentiation between the combined symptoms of *Vata, Pitta* and *Kapha*, in a *Sannipatic* fever (a fever due to the derangement of all the three doshas), along with the quantitative analysis, so to say, of their relative actions upon the system is an example of *Vikalpa Samprapti*. (समवेतानां पुनर्दोषाणामंशांशविकल्पो विकल्पोऽस्मिन्नर्थे। *Charaka, Nidana.* I, 10 iv)

Pradhanya (प्राधान्य) is the independent nature of a disease in two or more disorders. A man, for instance, is bitten by a dog. As the pain grows more and more acute, he gets fever, and suffers, so to say, from two different ailments, the wound of the bite and the fever. The physician however, has to find out that the wound is entirely independent of the fever, whereas the fever, whereas the fever is only a result of the reaction of the excessive pain of the wound. The knowledge of *Pradhanya Samprapti* also helps in the diagnosis of a disease. This is the knowledge of dependant, independent, or inter-dependant nature of the disease (स्वातन्त्र्यपारतन्त्र्याभ्यां व्याधेर्प्राधान्यमादिशेत्-Vagbhata, अप्राधान्यादिति शेषः - Vijayarakshita).

Bala (बल) or the strength of a disease is the study of the severity of the attack. *Bala* or *Abala*, i.e. the severity or the weakness of a disease is evident from its causes, symptoms, etc. by seeing whether they have fully or partly contributed to the disease (हेत्वादिकात्स्न्यावयवैर्बलाबलविशेषणम्).

Kala (काल) – *Kala* or time influences a disease in diverse ways. A fever, for instance generated by *Pitta* would reach, or tend to reach its climax in the summer season at midnight, or midday etc. A man in the prime of life would have a greater tendency to catch a *Paittika*–disease than a child or an old man. This division is according to the *Tridoshic* influence of the time-factor –(cp. "there is an endocrine (*dosha ?*), factor not only in health and ill-health, in diet and drug, but in heat and cold, rest and exercise, sleep and waking, sun and shade, in fact all nature's telluric influences act on and by the complicated systems of the glands of internal secretion. How else can we attempt to explain the systematic effects of such influences as wind, weather, altitude, climate, seasonal incidence, geographical distribution of disease – etc." Frindenberg (Barker's *Endocrinology Metabolism*).

When we find therefore, that a disease tends to grow at a particular period while it subsides at the other, the *dosha* that has the natural tendency to grow at the period of the growth of the disease may be taken to be a cause of the disease.

For a clear conception of these five factors of a disease the clinical methods of diagnosis should be adopted by the practitioner. Before entering the field of practice however, a physician should take the following precautions :

A practitioner should have clean cut nails and should keep short hair and beard, "a doctrine," as Capt. P. Johnston-Saint says, "which has been re-discovered by our modern bacteriologists." He should be dressed in clean white garments (नीचनखरोम्णा शुचिना शुक्लवस्त्रपरिहितेन - *Sushruta*). As the profession was generally controlled and patronised by the state, it is advised that the *Vaidya* should begin his professional career after being duly registered by the state:

राजाज्ञातेन विशिखा प्रवेष्टव्या।

"The practice should be started with the ruler's permission"

Sushruta, Sutra., X-3.

CLINICAL DIAGNOSIS

The physician, thus qualified, should set to examine the patient with the following methods of clinical diagnosis :

आतुरमभिपश्येत् स्पृशेत् पृच्छेच्च । त्रिभिरेतैर्विज्ञानोपायै रोगाः प्रायशो वेदितव्या इत्येके । तत्तु न सम्यक् । षड्विधो हि रोगाणां विज्ञानोपायः तद्यथा पञ्चभिः श्रोत्रादिभिः प्रश्नेन चेति ।

"The physician should inspect the patient, touch him and question him. Some hold that these three methods (inspection, touch and questioning) should generally be followed in order to ascertain a disease. But this is not correct, in as much as there are six methods of ascertaining the factors of a disease. These are :

1. *Shravana* (hearing)
2. *Sparshana* (touch)
3. *Darshana* (sight)

4. *Rasana* (taste)
5. *Ghrana* (smell) and
6. *Prashna* (oral enquiry).

Sushruta, Sutra., X,4.

Hearing (श्रोत्रप्रत्यक्ष) – The sense of hearing is utilised in recording the condition of the lungs, sound of the beat etc. According to Ayurveda the sound of the voice of a patient in chronic cases like pthisis is significant. The sounds produced by the patient's coughing, again help in the study of the respiratory conditions. The sounds arising from intestinal affections (अंत्रकूजन) and other tracts have a practical value in diagnosis: even the sounds of the wounds have not escaped the ear of the ancients, though they are still foreign to the modern stethoscope which is but a form of the ancient *Nadi Yantras*. Sushruta says, "The *Vayu*, making the blood ebullient, forces it up with a distinctly audible report and thus effects the sense of hearing (सफेनं रक्तमीरयन्न निलः सशब्दो निर्गच्छति) *Sushruta Sutra.*, X.5.

Touch (स्पर्शन) – The ancients had developed their sense of touch to a very high pitch indeed, if seen from their exhaustive records they have left behind of their vast knowledge of the pulse-beat in different conditions of health and disease. Dr. Ekendranath Ghosh, M.Sc. M.D., of the Medical College, Calcutta writes, "These conditions (of pulse) have not escaped the observations of the Ayurveda physicians and they have left the results of their observations for the use of their successors. This side of sphygmology probably dates back to the dawn of its history."

The various forms of pulse in the different states of health form in themselves, apart from the disease, a large portion of the science of touch in Ayurveda. Thus, for example, the beats of the pulse in anxiety (चिन्ता) agitation of mind (उद्वेग), anger (क्रोध), ascending a height (अर्ध्वगमन), comfort (सौख्य) defecation (मलदोष), different states of digestion (जीर्ण, अजीर्ण , etc.) exercise (व्यायाम) enthusiasm (उत्साह), exposure to cold (शीतार्दित), laughter (अट्टहास), sleep (शयन), passion and excessive sexual desire (काम), poisoning (काम), pregnancy (गर्भ), hunger (क्षुधा), thirst (तृषा), etc. were carefully studied and recorded. The knowledge of the pulse, in fact, had been cultivated with such delicacy and was so accurate, that this alone was sufficient for the correct diagnosis of disease. It has already been shown that in certain classes of chronic *shleshmic* fevers where the normal temperature of the patient falls very low the thermometer only serves to mislead the doctor (see Chap. IV). This fact however cannot escape the understanding of the Ayurvedic physician, who smells the danger at the right moment from the enfeebled beat of the pulse, and is ready in time to meet the approaching trouble. The knowledge of the pulse is undoubtedly superior to that of mere temperature as the former is a product of keener observation than the latter. Not that the ancients took no notice of the utility of the knowledge of temperature in clinical diagnosis (स्पर्शनेन्द्रियविज्ञेयाः शीतोष्ण...), but it was given a secondary place because there are certain fevers like *Vata-balasaka* (one of the fevers caused by *Vayu* and *Kapha*) in which there is no rise of the temperature, but the pulse signifies the presence of the disease. Again, there are different types of fevers in which the rise of the

temperature is the same, but the beat of the pulse serves to differentiate them from one another, thus rendering a greater help in the diagnosis of a disease.

The other purposes of touch were to feel the gloss, roughness, hardness, softness, and other qualities of the skin of the affected part in swellings, ulcers, etc. enlargement of the liver and the spleen, etc. etc. (श्लक्ष्णकर्कशमृदुकठिनत्वादयः स्पर्शविशेषाः) *Sushruta Sutra.*, X, 5.

Inspection by sight (दर्शन) – Too much stress cannot be laid upon inspection by sight as an essential factor in the diagnosis of a disease. Indian physicians who had developed the sense of hearing and touch a such a great extent could not lag behind in this branch of the clinical science. We find keen observations on the colour of the skin, eyes, tongue, teeth, nails urine, faecal matter, ulcers, swellings, etc., "fullness or emaciation of the body" (शरीरोपचयाचय), state of indications of vitality, strength, complexion etc., and various deformities of the different parts of the body (आयुर्लक्षणबलवर्णविकारादयः *Sushruta*).

It must be noticed in this connection that the ancients must have been in possession of some sort of instrument of the nature of the modern microscope, (अणुवीक्षणयन्त्र)otherwise they could not have discerned as they did, at that early period, the presence of microbes in the blood (see chap. V, *Tridosha* and Bacteriology), such as 'unicellular' (अणु), and 'invisible to the naked eye' (सूक्ष्मत्वात् भवन्त्यदृश्याः- *Charaka*) etc. That some means, therefore did exist, besides the mere naked eye, cannot be denied. There

can be only two alternatives firstly that they were really in possession of some fine instrument analogous to the modern microscope, or secondly they possessed some Yogic powers (यौगिक शक्ति) by which they could sense the things beyond the common perception. Their accurate knowledge of the stars and their movements and other general observations in astrology – an established fact – again suggest the presence of some instrument, like the modern telescope, in ancient Indian, or some other method of acquiring the knowledge of invisible objects, e.g. *Yoga.* There is little wonder in their being in possession of fine instruments, considering their monumental achievements in all parts of the science. In the second case, however, one point may be noticed with interest. Apart from the mysterious practices of the *Yoga* philosophy, the word '*Yoga*' has been extensively used in Ayurveda to mean a 'combination' (विधिवत्सुयोगैः- Sharangdhara). The yogic power (यौगिक शक्ति) in this sense is only a power, attained artificially by the aid of a combination of certain constituents. These combinations could not have been anything else than those instruments that could make visible what was formerly 'invisible to the naked eye.' When we know as a fact that lenses (e.g. सूर्यकान्तमणि) were known to the ancients, such an assumption may not be wholly thrown away without some consideration. It is however offered as a suggestion. For, when we consider the vast treasures left by the *Rishis* of ancient India, which, after the vicissitudes of the ages, the successive mutilation at the hands of the foreign conquerors, and the constant, ingenious, and cunning attacks of the modern propagandists like Col. Megaw, Mr. Pilcher etc., still survive to lend its light to the Western science (which owes many efficient cures and practices to the knowledge derived

from India), we may be easily led to believe in their superhuman intellectual powers. The facts stand – we find accurate microscopic observations – and there nust have been some means, either physical or metaphysical, in their possession, to study such conditions as were beyond the ken of the senses in their simple capacity.

Taste (रासन प्रत्यक्ष) – This, of course, the physician has to study on other objects without utilising his own sense of taste. The patient himself is a medium to know the taste of his mouth. Take, for instance, the case of a patient suffering from fever. If the taste of his mouth is sour (अम्ल) or pungent (कटु) *Pitta* is deranged, if on the other hand, it is saltish or sweet, the fever is due to *Kapha*. Again in the varieties of *Prameha* (शुक्रमेह spermatorrhoea, वसामेह albuminuria, मञ्जिष्ठमेह haematuria, मधुमेह diabetes- mellitus etc. etc.) the sweet or any other taste of the discharges should be inferred from the fact of their being or not being swarmed with hosts of ants or flies, etc.

Smell (घ्राण) – The smell of the stools, various kinds of urethral discharges (e.g. in the above mentioned varieties of *Prameha*) smell of the body of the patient, that of the ulcers, swellings etc., in their different stages, should be studied. The smell of menstrual discharges helps to ascertain the healthy or unhealthy nature of the menstrual blood. The purification of the mother's milk is prescribed in the disease of the children and smelling the milk helps the diagnosis. The organ of smell of the patient should also be studied in cases of nasal affections like catarrh etc.

Oral enquiry (प्रश्न) - The following extract from Sushruta would illustrate the importance attached to questioning the patient in Ayurveda :

प्रश्नेन च विजानीयाद्देशं कालं बलमन्तरग्निं वातमुत्रपुरीषाणां प्रवृत्यप्रवृत्ती कालप्रकर्षादींश्चं विशेषान् । आत्मसदृशेषु विज्ञानाभ्युपायेषु तत्स्थानीयैर्विजा-नीयात् ।

"Such facts as the time or season (of the first appearance) of the disease, the caste which the patient belongs to[1] and things or measures which tend to bring about a manifest amelioration of the disease, or prove comfortable to the patient (सात्म्य), as well as the cause of the disease, the aggravation of pain, the strength of the patient, and his state of digestion and appetite, the emission of stool, urine, and flatus, or their stoppage, and the maturity of the disease as regards time, should be specifically ascertained by directly interrogating the patient (on those subjects). Though the above said five organs of sense, like the three fundamental *doshas*, help us to make the correct diagnosis of a disease, still the objects locally perceived by these senses should not be left out of account in ascertaining its specific nature." *Sushruta, Sutra*, X.5

TREATMENT OF A SHARIRAKA DISEASE.

After a physician has correctly diagnosed the disease by the different methods enumerated above, he should set to treat the patient. It would be too much to attempt a representative description of the different methods of treatment adopted by the pioneers of Ayurveda, the scope of the subject being very vast, and an outline only therefore may be traced. The eight great divisions of the *Ashtanga* Ayurveda are :

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[1] Medicine was administered with due regard to the scruples of the patient as a member of a particular caste.

1. *Shalya Tantra* (Surgery)
2. *Shalakya Tantra* (Diseases of the eye, ear, nose and throat)
3. *Kaya-Chikitsa* (Practice of Medicine)
4. *Bhuta Vidya* (Treatment of Mental Diseases)
5. *Kaumara Bhritya* (Midwifery and Diseases of Children)
6. *Agada Tantra* (Toxicology)
7. *Rasayana Tantra* (Science of Prolongation of Life)
8. *Vajeekarana Tantra* (The Use of Aphrodisiacs, means of securing increased vigour, etc.

Surgery (शल्यतंत्र) - Sushruta calls surgery the first and foremost of all divisions, being the least subject to speculation. This statement may be verified from the fact that where medicine and surgery go together, surgery is held superior. At a time when surgery flourished in India, it was called the foremost, and today when its flourishes in Europe it holds the palm there, for the success of the Western doctors in the realm of medicine is a little more than meagre, as Professor Alexander H. Stevens, M.D., of the New York College of Physicians and Surgeons said, "The older physicians grow, the more skeptical they become of virtues of medicine and the more they are disposed to trust to the powers of nature." Such however, is not the case with he Ayurveda practitioner; the older he grows, the more he is convinced of the virtues of his country drugs so that he uses them every next time with an increased certainty. The ancient Hindus, however, were as much skilled in surgery as they

were in medicine. They performed most delicate operations which have already been dealt with in Chapter IV of this book. As the class of disease, which we are dealing with, is mainly concerned with the practice of medicine the information regarding surgery given in the fourth chapter may be considered sufficient. Most of our knowledge of the surgery of the ancients comes from Sushruta, though we find quotations in various commentaries from the surgical treatises of Aupadhenava (औपधेनव), Aurabhra (औरभ्र), and Paushkalavata (पौष्कलावत), whose works are now irrecoverably lost.

The diseases of the eye, ear, nose and throat (शालाक्यतन्त्र) – Though there are many ancient writers like *Janaka Vaideha* (जनक वैदेह), *Nimi* (निमी), *Krishnatreya* (कृष्णात्रेय), etc. Whose names we come across in the earlier commentaries of Charaka, Sushruta, and Vagbhata, but our main information is based on the last three authorities. The divisions of *Shalakya* is another field in which the Ayurvedists explored a great deal and attained a high degree of success. This has already been shown (Chap. IV) that the Western rhinoplasty owes its origin to India, as Weber confesses, "Indeed we have already borrowed from them the operation of rhinoplasty." The diseases of the eye were studied and skilfully treated. An eyewash with *Triphala* water, and application of *Lodhra* in cases of sore eyes, may still be envied by those who are accustomed to the slow and dull action of cocaine or atropine. The different forms of collyrium like *Prasadananjana* (प्रसादनाञ्जन), *Lekhana Anjana*, etc. form a different branch of the treatment of the diseases of the eye. Operations were performed upon the eye. Sushruta is the first author to

describe the are of cataract– couching, and his operation in pterygium and other diseases of the eye would do credit to any scientific nation of the world. The knowledge of errhines was varied and considerable. It is not our purpose to deal with the subject at length, as a short introduction to each is the only object of mentioning these diseases in the description of the diseases mainly treated according to the principles of the *Kaya-Chikitsa*.

3. *Kaya-Chikitsa* deserves a special mention being more connected with the *Shariraka* disease. This would therefore be dealt with at the end after a short note on every division of the Ayurvedic treatment.

4. *Bhuta Vidya* or the treatment of the mental diseases will be treated in the division of *Manasika Roga*.

5. Midwifery and diseases of Children (कौमारभृत्य). It has been shown that the ancient Hindus were adepts in craniotomy, caesarean section various turning, flexing and gliding movements, the application of forceps in the cases of difficult labour and obstetric operations. Fumigations, fomentations, and drugs in cases of pregnancy and child-birth, were administered with great success and generally the medical treatment was enough to effect an easy and healthy delivery. The *Punsavana*(पुंसवन), or the science of effecting the change of sex in the embryo in the womb, would probably, continue to be an incredible fact, till the Western physician announces his discovery to the same effect, led, either by his independent researches or by the information gleaned from this incessant source of the medical systems of the world–Ayurveda. The specific diseases of the children, apart from the common

ailments, generated from the mother's milk or other causes are in themselves a large branch of the science. The human milk was analysed and classified according to its different properties in healthy or vitiated state.

6. Toxicology (अगद तन्त्र), Poisons are classified as *Sthavara* (स्थावर immobile) and *Jangama* (जङ्गम mobile). Sthavara or immobile poisons are divided into *Udbhijja* (उद्भिज्ज vegetable) and *Parthive* (पार्थिव mineral) poisons. *Jangama* poison is the product of various poisonous creatures like snakes, scorpions, etc., sub-divided into *Mala-visha, Mutra-visha, Danta-visha, Shukra-visha,* etc. etc. The treatment according to the canons of Ayurveda in the cases of poisoning is remarkably successful. The immediate doses of ghee after the patient has been bitten by a poisonous creature or taken some poison has a wonderful effect in checking the spread of the poison. There is a large number of specifics for the different exigencies in the cases of poisoning, many of which have been tried with great success and many remain to be identified.

Most of the infectious diseases like plague were known to spring from the rats etc. which were also regarded as poisonous in the state of infection (vide *Sushruta, Kalpasthana,* Chapter VII). Sushruta describes eighteen kinds of poisonous rats. There are four large orders of poisonous insects, apart from poisonous types of leeches sub-divided into 107 different varieties; three orders of scorpions sub-divided into thirty varieties; and other creatures like house lizards, chameleons etc., which have been studied from the point of view of the actions of their poisons. To discern different symptoms of poisoning and prescribe their

treatment in cases of bites of hundreds of insects and animals must have required a patient and laborious research and we cannot but admire the monumental work of the ancients in this branch of science. The effects of poisoning by mineral and vegetable poisons like arsenic, opium, etc., have received the same attention as those of the animal poisons. Most of the poisons, including cobra-venom, were utilised for medical purposes.

7. *Rasayana* (Rejuvenation and Prolongation of Life). This branch of medical science is foreign to the Western doctor. In India, however it seems to have existed from times immemorial, for even in the Vedic period we find the rejuvenation of old Chyavana through the practices laid down by the science of *Rasayana*. Sushruta defines *Rasayana* as :

रसायनतन्त्रं नाम वयस्थापनमायुर्मेधाबलकरं रोगापहरणसमर्थं च ।

"*Rasayana* has for its object the prolongation of human life and refreshment and invigoration of the memory and the vital organs of man. It deals with recipes which enable a man to retain his manhood or youthful vigour upto a good old age, and which generally serves to make the human system invulnerable to disease and decay." *Sushruta, Sutra.*, I.

Rasayana has often been confused by some scholars (e.g. Cap. P. Johnston-Saint) with the term *Rasa-kriya* or chemistry, which is a different branch of Ayurveda altogether. The *Rasayanic* preparations (drugs that give vigour and long life) were divided into two groups – vegetable and mineral. Both of these have been fully dealt with by Charaka, who divides the method of Rasayanic *treatment* into *Kuti-Praveshika* (कुटि प्रावेशिक) and *Vata-Atapika* (वातातपिक). The

first consists in treating the patient in a closed chamber with a limited supply of air, the other should be conducted in the open air. It is important that no other medical system attaches so much importance to the treatment of the healthy individual as the Ayurvedic does.

8. Science of Aphrodisiacs (वाजीकंरण तन्त्र). This consists of measures by which scanty or defective semen is cured of its defects, or invigorated and increased in quality (if already in a healthy state), and is made to acquire its normal and healthy state if enfeebled by the indiscretions of youth. The use of *Vajeekarana* enhances the pleasure of sexual enjoyment (वाजीकरणतन्त्र नाम अल्पदुष्टक्षीणविशुष्करेतसामाप्यायनप्रसादोपचय जननिमित्तं प्रहर्षजननार्थं च ।) It is important as it helps one get a healthy offspring. The importance that was attached to the progeny is clear when Charaka says, "As a branchless tree that is without shade and without fruit, even so is man who is lone and childless." Though there are many examples of the organo-therapic treatment in Ayurveda, this special portion is studded with administration of preparations from the genital organs of various animals like cock, goat, bear etc.

One thing may be noticed – both the authorities, Charaka and Sushruta, do not prescribe meat, eggs, or other animal products in the whole length and breadth of the *Rasayana Tantra*, as they have extensively done in the *Vajeekarana Tantra*. The *Rasayanic* preparations are composed exclusively of vegetable and mineral drugs, while the *Vajeekarana* Drugs include all the three *i.e.*, the mineral, the vegetable, and the animal products. The tradition says that the former were meant exclusively for the *Rishis* or the beings of higher intellect, and the latter for all sorts of worldly

people; therefore the former are devoid of animal productions, which deteriorate the keenness of the intellect, and the latter contains all the three kinds for all sorts of persons.

KAYA-CHIKITSA

We will now take up the third great division of *kaya-chikitsa* which is mostly concerned with the treatment of the *Shariraka* diseases (excluding surgical treatment). A *Shariraka* disease is defined as an "unbalanced state of the doshas of the body" (रोगस्तु दोषवैषम्यं दोषसाम्यमरोगिता – Vagbhata). The health is that state of the body in which the three *doshas, Vata, Pitta,* and *Kapha* are in perfect equilibrium. The treatment of a disease consists in reducing the deranged *dosha* or *dhatu,* as also in strengthening the enfeebled *dosha* or *dhatu,* to maintain the desired equilibrium. The former is called the process of *Karshana* (कर्षण), the latter that of *Brimhana* (बृंहण).

KARSHANA includes *Samshodhana* (संशोधन) and *Samshamana* (संशमन) or the processes of cleansing and pacifying the deranged constituents. In more simple cases it consists of emetics, purgatives, or diaphoretics etc., according to the exigencies of the case, but in various chronic diseases of long standing, it consists of the famous *Pancha-Karma* (पञ्चकर्म) or the Five Processes of Ayurveda which are given below :

1. *Vamana* (वमन), treatment by emetics.
2. *Virechana* (विरेचन), treatment by purgatives.
3. *Anuvasana* (अनुवासन), administration of oily enemata.

4. *Niruhana* (निरूहण), administration of dry enemata.

5. *Shirovirechana* (शिरोविरेचन), purgation of the nasal organ and other secreting organs in the region of the head through errhines, massage, etc.

The patient has to undergo certain preliminary treatment, being subjected to *Pancha-Karma.* This preliminary treatment consists of two processes, *Snehana* (स्नेहन), and *Swedana* (स्वेदन), which consists of the administration of medicated ghees, oils, and fats, serves to lubricate the body, while that of Swedana consists in perspiring the body of the patient. The latter results in the drainage of all undesirable impurities of the body in the form of artificial perspiration. *Sweda* (स्वेदकर्म्म) however, is also used to signify the application of heat or fomentation even when perspiration is not meant to be produced. it also includes steam-baths, warm water baths, and hot cataplasms of medicinal plants.

After preparing the body of the patient by *Snehana* and *Swedana* for *Pancha-karma,* he is subjected to the five processes of *Vamana, Virechana, Anuvasana, Niruhana,* and *Shirovirechana,* respectively. *Anuvasana dravyas* or the oily enemata are administered before and after the process of *Niruhana.*

The process of *Vamana* and *Virechana* however, is again a considerable affair, and implies more than mere vomiting or purging can convey, Patients of different temperaments, and under different conditions of age, time, strength, etc., are to be treated with different grades of purgatives. Charaka alone enumerates 600 kinds of purgatives, out of 'an infinite

number of drugs' (असंख्येय योगानामपि च सतां द्रव्याणां विकल्पमार्गोपदर्शनार्थं षड्विरेचनयोगशतानि व्याख्यास्यामः- *Charaka, Kalpa* I, 6.) The vomiting and purgation is followed by the administration of the oily enemata, which consists of ghees, oils, fats, etc., medicated with drugs of various potencies, that not only soften the bowels but spread into the most subtile particles of the body. This is followed by *Niruhanavasti* or dry enemata and again an enema of the oils is applied. *Shirovirechana* is to the region of the head what other processes are to the other parts of the body. The process of *Pancha-Karma* lasts for several weeks, and even after the completion of the process the patient is advised to take restricted diet, to keep comfortable, and to avoid fatigue etc., for some days. At the end of the process the body feels light, healthy, and devoid of all physical worries.

It is impossible to present a synoptic view of the complete method and action of the process of *Pancha-Karma* in the short scope of the present essay. It is a great achievement of the ancients, which even after the lapse of millenniums, the Western science has grasped only in part, and the healing powers of *Annvasava* and *Niruhana* in chronic cases and nerve disorders are a mystery to the twentieth century scientist that still remains to be solved. The highly complex structure of the human body is an engine, whose machinery has not yielded the secret of its working, even to the finest instrument of the modern Western science, and amongst the greatest expounders, opinions are clashing against each other, simply because it is exclusively for the intellect to infer the true principle working behind the structure,–the microscope can only serve to visualise the picture, not the principle. It is very much like a layman gazing at an engine, he may admire

the outline, but further it is all a mystery to him. The ancients attached more importance to the principle than the structure. Not that they were ignorant in any way of the constituents or the structure of the human body, but the vital principle was given a greater attention as it decidedly deserved. The ancient Hindu succeeded in thorough analysis of the working of the human engine, for no other medicine except Indian deals so successfully and completely with the methods of repairing the whole system thoroughly. The process of *Pancha-Karma* is an ingenious and successful attempt at entirely overhauling and renewing for work the complex machinery of the worn-out human engine.

The *Pancha-Karma*, however, does not occupy the whole of the division of treatment, called *Karshana*. Practices like the application of leeches, bleeding (रक्तमोक्षण), venesection, (शिराव्यध), cupping etc., are other forms of *Karshana* treatment. The importance of *Langhana* (लङ्घन), or fasting, which has been only lately recognised by the Western doctors, formed another important branch of *Karshana*. Till now the so called 'qualified doctors' of the West were using milk, meat, brandy, etc., in early stages of various fevers, strengthening the disease in the name of strengthening the patient, and they called themselves 'rational'. The Ayurvedic system prescribes fasting in the preliminary stages of fever, and it is not long ago, since they have begun in certain hospitals in Germany, and other countries, to prescribe Diet Absolutum or the custom of fasting the patient for the first six days in fever. The exclusion of salt and water from the food of ascites or anasarca patients, advised by Ayurveda centuries ago, and only recently adopted by the West, is another

example of *Langhana* in which the aim is to reduce the excess of salts in the blood.

BRIMHANA is the branch which deals with the practice of strengthening the enfeebled *doshas*, *dhatus* and the organs of the body. This consists of *Rasa-chikitsa* (treatment by chemicals and minerals), and *Oshadhi-chikitsa*, or treatment by vegetable drugs and their products. Organo-therapy also forms a branch of the *Brimhana* treatment in Ayurveda. Charaka advises the administration of the preparations from the organs of various animals and birds in the *Vajeekarana Tantra*. There are liquors and oils for administration and massage, which are largely composed of animal extracts, used in various diseases. Just as the organs of an animal strengthen the analogous organs of man, similarly *dhatus* of other healthy creatures strengthen the analogous human *dhatus*. Thus Charaka says:

एवमेवसर्वधातुगुणानां सामान्ययोगाद्धद्धिर्विपर्ययाद्धासः । तस्मात् मांसमप्यायते मांसेन भूयस्तरमन्यभ्मः शरीरधातुभ्यः तथा लोहितं लोहितेनैव... अस्थिः तरुणास्थना - *Charaka Sharira*, VI 10.

'Thus through union with similar constituents the *dhatus* gain in strength, but through union with dissimilar they get enfeebled. Thus the flesh is nourished by flesh more than any other constituent of the body, blood by blood, bone (**अस्थि**) by cartilage (**तरुणास्थि**) etc.'

Charaka even goes so far as to state that the food consisting of raw foetus, or rather, an ovum in the raw or first stage, of some such animal as goat, sheep, etc., strengthens the conception (**गर्भस्त्वामगर्भेण**).

Rasa-Kriya and *Dhatu-Kriya* : The other two divisions, i.e. strengthening the enfeebled factor by administration of mineral and vegetable drugs, attracted more attention of the Ayurveda writers than was turned to organo-therapy. We will deal here with the mineral and chemical preparations of the ancients. The *rasa* and *dhatu-kriya*, as the branch of chemistry was called, made great progress in the hands of the ancient Indian physicians. The preparation of oxides and their administration was in itself a widely practised profession in ancient and medieval India. Even now we come across *Rasa-vaidyas* who treat their cases mostly by metallic preparations. Great proficiency was achieved by Hindus in this science, whose origin the Western antiquarians ignorantly assign to Arabia, though, centuries before Arabian chemists were born, chemistry had grown up into an independent and advanced science in India

The methods of *Dhatu-shodhana* or the purification of the metals described by Hindu writers cannot be explained by any extent of the Western knowledge of chemistry. Take, for example, the case of *Makaradhwaja*. It is a drug of undoubted celebrity not only in the sphere of Ayurveda medicine, but interesting to certain Western doctors too. We come across advertisements of Merck's *Makaradhwaja* (Germany), sold about thirty or forty times cheaper than the indigenous preparation sold by the Ayurvedic physicians! The Western preparation, when tried on patients fails to show its intended results. Yet the composition of the indigenous and foreign *Makaradhwaja*, according to the Western knowledge of chemical analysis is the same, for both are compounds of mercury, sulphur and oxygen. The exact method of preparation of the German *Makaradhwaja* is not known, but

this is almost certain that the German chemists have no idea of the process of purification of the metals as viewed by the Ayurvedic chemists. They extract mercury generally, for the medical purposes, from cinnabar, and the presence of mercury in cinnabar is known to the Hindus from a period of great antiquity. After mercury is thus obtained, it is subjected to the process of *Shodhana*, which consists in keeping the mercury for different periods of time in different drugs, the majority of them being poisonous. When mercury has undergone the prescribed treatment of being kept in various bulbous roots, cataplasm, juices and other vegetable products, it is oxidised with sulphur, which has also been purified by being melted in ghee, sifted through a cloth and cooled in milk. The process is conducted in the presence of gold which serves a sort of constructive factor in the formation of *Makaradhwaja*. The oxidisation should be completed in seven days and seven nights, or in some cases three days and three nights. If the mercury is oxidised in a few hours, the oxidisation may be complete but it would not acquire the required medical properties. This will be clear from the following method of *Puta-paka*.

An important discovery in preparing the oxides of metals is the practice of continued partial oxidisation, or *Puta-system* (पुटपाक विधि). Mica, for instance, can be completely oxidised even in one or two *Putas*, i.e. after being subjected to the action of fire once or twice only. The ashes of mica thus obtained would be very inefficient in their virtues compared to those that have been obtained by subjecting mica to the action of fire a hundred or even a thousand times. But if the mica has been completely oxidised in the first *Puta*, or the first action or the fire, there would be no increase in the

efficiency, even if it is oxidised a thousand times again and again. When a hundred *Putas* or 'uniform heats' are given in such a way that the oxidisation of mica is not complete before the last *Puta* is over, then only the desired virtues can be imparted to the mica; if on the other hand, the mica is fully oxidised somewhere in the course of twenty, thirty, or more or less number or *Putas*, it is useless to take the number of *Putas* to one hundred, for the oxidisation is intended to be partial in every *Puta* till it gradually reaches the completion, when the last *Puta* finally oxidises the mica. The larger the number of the *Putas*, the greater would be the efficiency of the oxidised metal, provided the number of the Putas has not been rendered futile by a thorough oxidisation of the metal, somewhere in the middle of the process (पुटैः संजायते गुणः *Rasendra Sara Sangraha)*. This is not a story from the books on rituals, but what is daily verified in practice by the practitioners of the Ayurveda system. It is futile to look for explanations of these processes from the modern Western chemists.

These preparations mostly consisted of tonics of various kinds and were sometimes used as aphrodisiacs and *Rasayanic* medicines. *Makaradhwaja*, - whose efficacy is recognised by the Western doctors of such standing as Sir Charles Pardey Lukis, who, as Mahamohopadhyaya Gana Nath Sen tells us, "used it with a fairly proper judge of its value," -- is one of the greatest triumphs of Ayurveda, which stands unparalleled amidst all the Western specific in its field of action. The ashes of pearl, conch, cowrie and coral are all of the same colour and composition, all are oxides of calcium, but for the Ayurvedist, they are entirely different from each other in their various medical properties, and he administers

them to great advantage in many different maladies. The ashes of diamond and other precious stones are also included in this branch of medical chemistry.

It may be stated here that there are no hard and fast lines of demarcation in minerals, vegetable and animal products, as to whether they belong to the *Karshana* or *Brimhana* class of medicines, except certain extreme cases. The ashes of conch for instance, belong to the former in respect of their reducing properties in cases of enlargement of liver, or spleen, etc., but in their preservative aspect they are *Brimhana* or strengthening. A laxative is a reducing medicine on one side and strengthening on the other. This holds good in the case of animal productions also.

The *Brimhana* treatment by Vegetable Drugs is based on very much the same principles on which the treatment by animal or metallic preparations is founded. The purgatives, emetics, errhines, etc., are reducing herbs while nourishing and invigorating ones are 'Strengthening' or *Brimhana*. There are five properties of the drugs. These are :–

1. *Rasa* (रस)
2. *Guna* (गुण)
3. *Veerya* (वीर्य)
4. *Vipaka* (विपाक)
5. *Prabhava* (प्रभाव)

Rasa or the taste, is of six kinds, namely, 1. Sweet (मधुर) 2. Sour (अम्ल) 3. Salt (लवण), 4. Pungent (कटु), 5. Bitter (तिक्त), and 6. Astringent (कषाय)

The sweet increases in activity of *Kapha* in the body; the sour and the salt of *Pitta and Kapha, the pungent of Pitta and Vayu and the bitter* and the astringent of Vayu only. The *Rasas* other than those which increase the activity of a particular *dosha* would prove detrimental to the activity of that *dosha*. Thus sweet bitter, or astringent would reduce *Pitta* as pungent, bitter and astringent would reduce *Kapha*.

Guna:- *Gunas* or the attributes of various substances are divided into five classes, namely. Heavy (गुरु) Unctuous (स्निग्ध), Keen and Sharp (तीक्ष्ण) Dry (रुक्ष), and Light (लघु), each representing the attributes of the Earth– Water–, Fire–, Air– and Ether– substance respectively. These are further sub-divided into a large number of attributes like sharp (खर), hard (कठिन), thick (सान्द्र), cold (शीत), mild (मन्द), soft (मृदु) etc. The drugs carrying the attributes of water– and Earth-substances increase the activity of *Kapha* Fire-substances of *Pitta* and Air and Ether substances of *Vayu*.

Veerya : Veerya is the potency of a drug. It is either heating (उष्ण) or cooling (शीत). The first is dominant in *Pitta*, the second is a common factor in *Vayu and Kapha*.

Vipaka – Vipaka is the consequence of change or action which the drug undergoes in the human organism and is of three kinds namely 1. Sweet (मधुर), 2. Sour (अम्ल), and 3. Pungent (कटु). As a general rule the sweet and salt *Rasas* are changed in the course of *Vipaka* into sweet, the sour remains sour, and the pungent, bitter, and astringent, are transformed into pungent. The sweet strengthens *Kapha*, the sour *Pitta*, and the pungent *Vayu*.

Prabhava : Prabhava is the dominating influence or the active force of a drug. Amalaki (Emblica Officinalis), for instance, is very mild in *rasa, guna, veerya and vipaka,* yet, it has the potency of reducing the three *Doshas* when taken internally. Similarly we find that the root of Vernonia Cineria (सहदेवी) tied with the hair of the head destroys the quartan fever (शिरोबद्धा हन्ति चातुर्थिक ज्वर). A few drops of the juice of Leucus Cephalotes (द्रोणपुष्पी) poured in the eye of the patient, remove the quartan fever. There may be two herbs similar in all the other four properties, but might show different results owing to their fifth quality of *Prabhava.*

The drugs according to the exigencies of each case should be administered singly or in combination. But there are factors which are beneficial in their separate capacities but grow harmful when brought together. Even this branch of the knowledge of harmful combinations of drugs and diet was reduced from empirical knowledge to general principles. Substances, suitable in themselves to the body, were found to grow unsuitable under the considerations of their place, time, mixture, mixture and nature, etc. Fish for example, especially of *Chilchima* variety should not be taken with milk; the meat of domesticated animals, of those that live in marshy regions, and of those that are aquatic, should not be taken in conjunction with such things as honey, sesame oil, molasses, milk, garden radish, lotus stalks, paddy (when sprouting) etc. etc. - *Charaka, Sutra.*, XXVI 86.

MENTAL DISEASES [1]

A word about the mental diseases, as they form an integral part of the Ayurvedic system. The mental diseases are divided into (i) partly mental and partly physical, and (ii) purely mental diseases. The partly mental are diseases of the nature of insanity, epilepsy, etc., which influence the mind and the body both at a time. The purely mental are excessive anger, grief, fear, joy, despondency, envy, misery, pride, greed, lust, desire, malice, etc.

(मानसास्तुक्रोधशोकभयहर्षविषादेर्ष्याभ्यसूयादैन्यमात्सर्यकामलोभप्रभृतया: इच्छाद्वेषभेदैर्भवन्ति) -*Sushruta, Sutra, 123.*

The treatment of the physico-mental diseases consists in adopting the measures described in the physical diseases side by side with the mental treatment, which is analogous to the modern psycho-analysis. Charaka writes :–

मानसो ज्ञानविज्ञान धैर्य्यस्मृतिसमाधिभि: ।

"The mental disorders should be cured by the help of imparting knowledge and developing the understanding of the patient, by soothing him, or by *waking up forgotten and sub-conscious ideas* (स्मृति) and by prescribing the practice of meditation, etc."

[1] This portion dealing with mental and 'natural' diseases has been curtailed as an independant supplementary volume on this subject is in preparation.

'NATURAL' DISEASE

The 'natural' diseases are hunger, thirst, sleep (these qualities are different from those generated by the effects of ill-health), birth and death.

The treatment prescribed is the means to attain salvation (मोक्ष) and involves philosophical dissertations on Nyaya, Sankhya, Vedanta, Yoga and other systems of Hindu philosophy. Certain Ayurvedic physicians are of opinion that all the six schools of Indian philosophy (for the Ayurvedic system dates from a much earlier period) sprang up from this branch of Ayurveda and later on developed into independent sciences, the subject being very fascinating to the ancients. Both the writers, Charaka and Sushruta, have spent a deal on the subject but as it is too wide to be treated in a small treatise on medical science, it may at present be dropped.

CONCLUSION

In this rough and hurried survey, I have been able to touch only the fringe of the vast system of Ayurvedic medicine. Enough, however has been said to establish the scientific nature of its principles. Ayurveda has been vilified in season and out of season by many a foreign critic. In recent years it has tickled the spleen of Col. Megaw, Col. Nelson, Miss Mayo Mr. Pilcher, Major Hooton, and other of their ilk. It has been called unscientific, empirical, unsystematic, stagnant and what not. These accusations, however, have been refuted by many Indian scholars by comparing and contrasting the Ayurvedic and the Western systems of medicine in certain details, and pointing out the unstable nature of the latter. In the Appendices, I have given extracts from the writings and speeches of some of the pioneers of Western medicine who have looked at their own science with distrust and suspicion. As regards Ayurveda, I have not tried to defend it -- it needs no defence – by exposing the hollowness of the pretensions of some of the followers of Western medicine. Others have done this, and successfully. I have only placed a brief exposition of the highly scientific basis of the Ayurvedic system before the reader. The value of the system is for him to judge for himself. As for those who call it stagnant, I would remind them that an unstable science groping in the dark is not necessarily progressive nor a stable science based on true and unchanging principles stagnant. Progress means a move in the right direction, and it ends when the destination is reached. The conflicting and unfounded theories of the Western medicine cropping up in large numbers lead nowhere. No theory of the Western pathology can satisfactorily explain the origin of all the

diseases by uniform application. The principles of Ayurveda are founded on keen observation and solid facts. This cannot be said of the Western science as Col. Nelson himself says, "Our books are almost out of date before they are printed." "Yesterday, it was the perfidious Bacillus," says Dr. Sen Gupta, which was at the root of all diseases. Today, it is the disturbances in the Endocrine system. To-morrow it is just possible that changes in blood alkalinity will be alone responsible for all our troubles. We are not sure about our truths, and are constantly shifting ground, even in such an important matter as the origin of diseases." "We have lingered long enough", says Dr. Muthu, in his *Pulmonary Tuberculosis*, "on the milestone of bacteriology. We are now tempted to stop at bio-chemistry. Further on the way sociology meets us and psychology beckons us." "Germs are one of the existing causes of diseases. Modern Western medicine thus classifies diseases as infective, traumatic, toxic, metabolic, psychic, etc. Ayurveda covers all this (for they take into account the soil). Don't mistake the part for the whole." (Captain Murti).

Those that have called Ayurveda unscientific might have done so in their ignorance, but those that have called it dead have no excuse to hide their falsehood behind the curtain of ignorance. The Ayurvedic system lives to-day a more glorious life than the Western System of medicine. The former lives by its worth, the latter by the aid of the state. The indigenous system is treating more than ninety per cent of the Indian population and that entirely by virtue of its popularity and comparatively greater efficiency.

Certain advocates of the Western System of medicine smelling danger in the Ayurvedic system have started a

malicious propaganda against it, which, fortunately, has not shown any considerable results. There are others whose motives are worse still. These people, however, should be taken at their worth. But apart from these there happen to be critics of Ayurveda, who while criticising the subject are unaware of the subject of their criticism. These men are dangerous in as much as they make unconscious attempts to bring down the educated men to their own level of ignorance. the present volume is intended to remove their ignorance and to warn their readers.

APPENDIX – A

OPINIONS OF SOME FAMOUS MEDICAL MEN ON WESTERN MEDICINE

The most distinguished doctors who are also scientific men, have found it to be invariably the case, that the more they saw of disease, the less they believed in the efficacy of the drugs they has been using for years, and the more they believed in the natural forces of the body, and the more inclined they were to be content with playing a waiting game, instead of forcing their great partners hand – *Mad Doctors* by One of Them, p. 12.

The older physicians grow, the more skeptical they become of the virtues of medicine, and the more they are disposed to trust to the powers of nature – Prof. Alexander H. Stevens, M. D. New York College of Physicians and Surgeons.

Efforts have been made to reach the elements of the disease, but not very successfully, because we have not yet learned the essential nature of the healthy actions and cannot understand their derangement – Professor George Birdwood, M. D., Jefferson Medical College, Philadelphia.

All our best treatment is empirical ...I should have preferred to have offered you some principles based on

scientific grounds, and on which you could act in particular cases ... At the present day this cannot be done, nor is it wise to speak of 'principles' when framed from conclusions whose premises are altogether false. To say that I have no principles is a humiliating confession. For my own part I believe that we know next to nothing of the action of medicines and their therapeutic agencies ... Dr. Samuel Wilks, F. R. C. S.

Young doctors who have just come from the college, and who are primed to the brim with the vast stores of (quite useless and largely erroneous) theoretical knowledge, are to be sure, confident that they know all about the nature of disease and its proper 'treatment' under every conceivable condition, for have they not a drug for the cure of every disease? But with the older physicians such is by no means the case – Hereward Carrington, in *Vitality, Fasting and Nutrition*.

The majority of medical treatment today is purely empirical, and really a vast series of experiments upon the patients ... I must go further in my criticism of the medical profession – or rather their methods of treatment, for them as men, I have no quarrel whatever ... What little the medical profession is supposed to know of the nature of disease is totally wrong; their theories of the origin and nature of disease are erroneous *ab initio*, and that every new discovery made, which they have considered an unmixed blessing and a sign of progress, has, only led them further and further from

the truth, and away from understanding of real cause and cure of disease. – Ibid.

These physicians although able, learned, earnest and scientific, have been utterly misled as to the nature of the disease. – Emmet Densmore, M. D.

I venture to think that the conception of which was the basis of medicine *a la mode* was not in accord with the facts. – Sir Fredrick Treves, Sergeant Surgeon to the King of England, *London Times* Nov., 3, 1905.

There are two methods of treating dyspeptics; one aims to cure the disease, the other endeavours to cure the patient ... (Western) Medical systems profess to cure the disease and they can do it, whatever becomes of the patient. – R. T. Trall M. D.

It is more than time that the public should face fairly the truth about the medical profession ... Medicine (Western) as practised today (1927) is not a science. For, by medicine I mean the scientific use of drugs to cure diseased conditions. This is the art of medicine, and the study of drugs with this object is the science of medicine. Doctors increasingly admit that drugs are very little used curatively.

The orthodox medicine says that chronic diseases are incurable. Acute diseases are spontaneously cured, they admit, unless they kill the patient (e.g. Typhoid treatment).

What is the cure for Influenza ? Have they any treatment for Small Pox ? Doctors can make healthy people unhealthy by vaccination, yet they have no means of making Small Pox patients healthy ... What is the reason for this ? Scientific study leads to no result–Why is medical study sterile ? In pursuing their study modern medicine has lost sight of its proper end or they have pursued it by wrong means.

Every medical student knows how much time is given to diagnosis and how little to therapeutics. People do not want to know what particular hybrid word describes their complaint – they want to be cured. Diagnosis, they say in defence, should precede cure (Tuberculosis is readily diagnosed. Its cause is ascertained since the discovery of T. B. by Koch but its cure is as far removed even now as before the days of Koch about half a century ago).

If you want to cure diseases by medicine, study drug action, the effect of medicine on the human body (not on animals) on the bed side (not in the laboratory). You must study the specific action of drugs, not the specific actions of drugs on the causative factor; for the same disease may be caused by different causative factors and the same cause may produce different causative effects on the human body. Though Doctors have studied the latter, they have not done the former. A drug may be specific for the cause, yet not specific for the disease, for human body is something different from the laboratory test tubes.

The two cardinal errors of orthodox (Allopathic) medicine are the classification of disease and the classification of drugs. A particular set of symptoms is held

to constitute a definite disease with a rather narrow margin of "Atytical cases," A definite name is given and it is hoped to find a drug which will be specific for that disease. (Typical and atytical cases alike). Every clinician knows that text-book symptom combinations are rarely found. The same etiolocal factor is present in both typical and atytical cases, yet the symptom complexes are different; how then can one expect to cure the disease by the same drug ? The Doctors take into account the seed only, ignoring the soil. Hence they miserably fail in attaining the results desired.)

They have not yet learned to classify drugs, for they take into account their physical and chemical properties. To use them curatively you have to study an action which is neither chemical nor physical but specific to the vital force in the organism. In other words, drugs to be successfully used for cure must be studied from sympathetico-Endocrinological or *Tridosha* point of view.

If man was merely a psycho-chemical entity, the study in orthodox ways might have been sound. To study how drugs act in the human body and not in a test tube or in the body of animal is the A.B.C. of medicine which doctors have not learnt as yet. – – Mr. Raphael Roche, *Journal of Ayurveda*, June. *1927*.

There are indeed, more quacks inside the medical profession than outside – – and the former are much the more dangerous–Lt. Col. C. A. Gill–Indian Medical Record, March 1929.

It is perhaps a sign of the times, that serious expression of opinion in which the methods and beliefs of modern medical practice and research are called into question, will no longer occasion astonishment and incredulity on the part of the educated public, although they do no give rise to increasing amount of anxiety. The empiricism on which medical treatment is still based (we are not considering surgery) is being gradually recognised. Thus an announcement, say, by the British Medical Association that it had come to the conclusion that its boasted method of vaccination, innoculation and immunisation were after all based on error, would occasion far less surprise to the general public than to the profession itself.

Microbe-hunting as a serious medical task is fast becoming discredited (with the advent of Endo-crinology and Bio-chemistry). The false trail, started by Pasteur, is being recognised at its real worth. Last week the 'germ seekers' received a distinct shock, for Barker, the well-known surgeon in his work on 'Cancer' directed a vigorous frontal attack on them. He maintains that the failure of the cancer-research is one of the greatest scandals of modern times, for it is mainly directed to discovery of that illusive microbe. He is one of those who believe that the dread disease is due to erroneous diet and insufficient exercise (cp. मिथ्याहारविहार of Ayurveda) and certainly the manner in which the incidence of cancer has progressed with the 'over-civilisation' of modern times, seems too remarkable to be merely coincident. *Chemical Trade Journal and Chemical Engineer–quoted in Journal of Ayurveda October 1928.*

The champions of bacterial theory hold that germs are the cause of diseases, but we have been instances where

similar germs have produced different effects in different mediums. The scientist at once brings forth the theory of 'Natural immunity', and at the present time the Endocrinologist would attribute it to Endocrine efficiency or deficiency. Does not the latter give a lie direct to the bacterial theory, at least to the universality of it ?

Old Ayurvedists discovered germs of diseases more than 2000 years ago, yet they had the common-sense not to call them as the universal causes of disease. According to them they are simply a condition. Given the field in a suitable condition for the culture of these bacillii, the disease will occur – not otherwise. It is only when the equilibrium of the *dhatus* is disturbed that the disease germs which exist everywhere get the upper hand of the tissues. The *Tridosha* theory according to Ayurveda is not opposed to the germ-theory, but comprehends it. The germ theory is after all not at variance with the other theory Dr. M. R. Samey, Ph. D.

IGNORANCE OF THE OFFICERS OF THE I. M. S.

"Under present day conditions, when the newly qualified English medical man comes to this country, whether as an officer of the I. M. S. or of the R. A. M. C., as a doctor to a group of Tea-gardens or as a medical missionary, he soon discovers that he is up against facts and conditions of which he has had no previous experience. In a lesser degree the newly qualified Indian medical graduate of an Indian University finds the same thing ... However brilliant a medical student he may have been, he is in a world of disease of which he has but a scanty knowledge ... With regard to the I. M. S. and R. A. M. C. the 'Milbank course' is supposed to remedy this defect but does not do so practically as it is

unreal and divorced from the actual facts of the situation – (Editorial, I. M. *Gazette*, November, 1924).

The European I. M. S. officers have no practical training of Tropical diseases; yet they are forced on India simply to solve middle class unemployment question in England at India's expense. *Journal of Ayurveda* September, 1928.

Western Specifics

The modern system of medicine is greatly in doubt whether alkaloid Quinine is better than Cinchona – the entire plant, what salts of quinine should be used with the best advantage, insoluble or soluble, what form of administration should be preferred and what dosage should be administered. The highly applauded quinine fails when the parasites become Quinine-proof. Scientific medicine is still lamentably in the **dark** as to explain satisfactorily the effects of quinine itself on the human system known as Quininism in its multifarious aspects.

Scientific investigation had rejected Emetine and used Ipecac minus Emetine and now the same scientific medicine has turned round and using Emetine with a vengeance, often indiscriminately in all cases of fever. The truth discovered under the name of scientific medicine is so variable that the truth of today is rejected as false the next day ... The scientific system is yet to find a natural law which pervades medicine – *Journal of Ayurveda.* December 1925.

The British pharmacopoeia is very poor in drugs and there are hardly medicines enough to treat cases properly. As

a result scientific practitioners forget their science and use patent medicines with which the market is flooded. *Ibid.*

The army of doctors trained in Western medicine with the paraphernalia of costly laboratories and scientific instruments are, in the field of medical practice, not half so scientific as they are expected to be. It is a strange irony of fate that common-sense and science go ill together amongst them. Whilst the use of unaided sense of medical man is fast giving place to scientific methods, the cost and confusion (of the diagnosis of the case) of the poor sufferer is daily increasing. The majority of patients cannot be diagnosed without costly laboratory aid. The doctor and the patients are alike duped by patent medicine mongers from the West – Kaviraj Gannanath Sen. M. A., L. M. S.

Take our attitude about giving salt in Anasarcal conditions. Old students of Calcutta Medical College will remember the cheap snear at Ayurveda, of some of the distinguished clinical teachers there, for advising the withdrawal of common salt, from the diet in Dropsy cases. The doctors extolled the diuretic virtues of salt, and advised giving salt in more than normal quantities, to promote diuresis and lessen the Anasarca, in sublime oblivion of the fact that their collosal ignorance and conceit could not but hasten the unhappy patients to their grave. The Professors laughed at the absurdity of Ayurveda. The students laughed with them. Everyone was happy to have such an easy target of attack and ridicule, as the Ayurveda. Unfortunately for scientific medicine, however, the discovery of Widal and Javal about

effects of retained chlorides filtered into India in the late nineties. The exponents of scientific medicine had to make a *volte face*--and this they did with the same easy self-complacency as before. Nothing daunted, the professors then began to teach that Oedema was due to sodium chloride retention and advised the withdrawal of salt, from the diet in the anasarcal conditions. The past was quickly forgotten and the Western system was still looked upon as exclusive repository of scientific wisdom and poor Ayurveda still continued to be damned light-heartedly as nothing unscientific.

Take again the Ayurvedic dictum of the close connection of malarial fever and filaria, with the phases of moon. For a long series of years, Western medicine had nothing but contempt and ridicule for this dictum, although its obvious truth cannot escape the eyes of the meanest observer, who is not steeped in pride and ignorance. Just a few years ago a distinguished English Professor of medicine, in the Calcutta Medical College, when he was first told that filarial fever recurred with certain phases of moon, simply burst out laughing and told this young House Officer, "My dear lad, you do not mean to say that filaria are lovers, promenading about in the moonlight ! No, no, it is all rubish." But in less than three or four years, the laugh had gone and the doctor had changed so much that he suggested filaria whenever a man complained of fever relapsing with the phases of moon. There was no more talk of moon light promenades but the fund of self-sufficing contempt remained unabated all the same. –Dr. Nalini Ranjan Sen Gupta, *Journal of Ayurveda,* October 1926.

There was a case of hiccough following an operation of appendicitis by one of the leading Surgeons of Calcutta, which baffled the joint attempts of the best surgeons and physicians of Calcutta but was promptly relieved by Ayurvedic treatment.

Another case of infantile convulsion which could not be relieved by the joint attempt of a Civil Surgeon and two assistant surgeons was promptly relieved by a mediocre Vaid in a district town in Bihar.

As an illustration, it may be mentioned that in the West in transfusion treatment, sometimes the patient suddenly dies without any reason or any apparent fault of technique. It is being slowly recognised that the donor and the recipient are incompatible (Dr. Geoffrey Keyner, M. D. of St. Bartholomew's). This is easily accountable by the Ayurvedic theory of temperament which also explains how such catastrophe in transfusion treatment (which is recently revived and is daily increasing in popularity) can be completely avoided.

Protein intoxication, anaphylaxis, idiosyncracy, terms for certain drugs and diseases and many such puzzles of modern medicine which are more or less a jugglery of terms recently coined to mystify people about the ideas vaguely conveyed by them can be more satisfactorily explained by the Ayurvedic theory of temperament – *Journal of Ayurveda*, April 1926.

APPENDIX - B

It would be clear from what has been said in Appendix A, that some of the great 'qualified doctors' have themselves expressed their disbelief in the efficacy of their system. It should be noticed in this connection that these doctors have every right to condemn their system since they do so after they have gone through a complete course of training in the subject and are fully acquainted with its principles. The censors of Ayurveda, on the other hand, who are mostly Europeans, have, as has already been pointed out, not the slightest knowledge of the principles and practices of this science. Their criticism, therefore, has only the value of an ignorant and selfish outburst. But great doctors like Sir Pardey Lukis, Sir Havelock Charles and others have Pronounced their judgement on Ayurveda, after a consideration well worthy of these impartial critics. They are men who feel no shame in admitting that India, even in her fallen condition, possess a system, far more beneficial and advanced than their own; for, to them science is science irrespective of any caste or creed and not the sole monopoly of the West. Their word is an authority in so far as it comes from those who possess an intimate knowledge of both the systems of medicine, Western and Ayurvedic. The following are the opinions of some of the greatest doctors on the Ayurvedic system of medicine :–

If the physicians of the present day would drop from the pharmacopoeia all the modern drugs and chemicals, and treat their patients according to the methods of Charaka, there would be less work for the undertakers and fewer chronic invalids in the world.–Dr. G.E. Clarke, M.A. M.D., of Philadelphia.

The longer I live in India; the greater will be my appreciation of the wisdom of the ancients, and the more will I learn that the West has still much to learn from the East--Sir Charles Pardey Lukis, Surgeon General to the Government of India.

I resent strongly the spirit of trade unionism which leads many modern doctors to stigmatise all vaids and hakims as quacks and charlatans...... We are just emerging from the slough of empiricism. Personally if I were ill I would prefer to be treated by a good vaid or hakim than by a bad doctor...... I am not alone in my opinion as regards the value of the indigenous system of medicine. If I err, I do so in good company among whom I may mention my friend and colleague Sir Havelock Charles, Col. King of Madras, and Dr. Turner of Bombay...... There is no doubt whatever that their (Indians) ancestors knew ages ago many things which are nowadays being brought forward as new discoveries. – *Ibid*.

I am only repeating to you what the Aryan medical science preached two thousand years ago and am reproducing to you only a small fragment of the lesson taught by Charaka. – Sir Havelock Charles. Medical College, Calcutta.

Ayurveda and not the Western medicine is the medicine of the people (of India); it is deep-rooted in the customs and habits of the people; its dietetics are based on Indian dietary and meet Indian requirements as to caste, creed and constitution.... practitioners of western medicine ignorantly

believing that there is no body of truth which that (Western) system does not deal, ignore it. They would do better to study it and take from it what is good..... Many of leading Ayurvedic practitioners are men of great clinical acumen and skill. -- Lt. Col. R. Knowles.

I am not ashamed to state that on many an occasion, I have succeeded with the Indigenous system where Allopathy failed. -- Col. Ganpat Rai, I.M.S. (*Andhra Medical Journal*, February 1942).

"The principle of Ayurvedic treatment," says Dr. Carpenter, "is based on *vis Medicatrix Natrae* or the unerring laws of nature."

I know that you (Vaids and Hakims) can diagnose and treat all diseases, and that your treatment of such diseases as Asthma, Ascities, Insanity, Diseases of the Brain, Spine and Generative Complaints is very successful under the climatic conditions of the country and the habits of the people. – Col Maclarenn, I.M.S.)

"The application of drugs in Ayurveda according to Tridosha theory enables the physician to handle simple Indian drugs with marvellous therapeutic effects and beats hollow the jejune laboratory and Vivisection standards of Drug application. European medicine has already borrowed many important drugs from Hindu medicine..... whose application to diseased conditions is based on actual clinical experience

on human bodies in illness and not in the test-tube or body of animals – Dr. M. R. Samey, Ph.D., M.D.

Old Ayurveda..... modernised and rejuvenated ..... will not only be the national medicine of India, but will play no small part in the uplift of the international medical system of the world – *Indian Medical Gazette.*

It is impossible for any body of men to work out a scheme of medical education which is divorced from the tradition of the past.... The average student (of Indian Medical Colleges) has confused ideas and is unfitted for his life work – *Ibid.*

It is essential that close contact should be maintained with all that is best in medical science and irrespective of all other considerations, the palm must go to those that deserve it–*Lt. Col.Gill. I.M. Gazette,* March,1929.

Vaccination was known to a physician Dhanvantari who flourished before Hippocrates–Dr. Huillet of Pondicherry.

During my stay in India. I had ample opportunities to see the splendid revival of the oldest system of Healing.

It will deserve the place it is rapidly gaining not only in India but in other countries of the world. Some regulations should be set so as to save the system from the invasion of the

ignorant and the ill-trained–Dr. Walter Seth Kipnes, M.D.Ph.D. of New York.

When I remember how many of those who have means of access to consult best doctors, still prefer to be treated in accordance to the indigenous system of medicine, I come to the conclusion that I should be wrong to discourage the scheme which aims at improvement and development of this (Eastern) branch of medicine. -- Lord Hardinge, Ex-Viceroy and Governor General of India.

Hindu Shastras also contain a Sanitary Code no less correct in principle, and the great law-giver Manu was one of the greatest sanitary reformers the world has ever seen --Lord Apmthill, Ex- Governor of Madras.

When we undertake municipal water supply schemes, with filter beds and hydraulic pressure, when we build hospitals and establish medical schools, when we promulgate regulations to check the spread of plague, or when we impose on local bodies the duty of watching over the health of the people, we are not introducing any modern innovations or fads, but merely that which was done centuries ago and again, centuries before that.... both Hindus and Mohamedans used innoculation by small pox virus as a protection against small-pox long before Jenner's rediscovery of vaccination.... Modern plague policy of evacuation and disinfection is not a bit different from that enjoined in ancient Hindu Shastras –*Ibid*.

In medicine you (Indians) are still more advanced. In the West it is by no means a science but largely guess work Indian medicine, both of the Hindus and the Mohamedans is superior to the medicine of the West – Mrs. Annie Besant.

Indian chemical skill is more striking and more unexpected –Mr. Elphinstone.

The people of India should be grateful to Col. King for having pointed out to them they can lay claim to having been acquainted with the main principles of curative medicine when Europe was still immersed in ignorant savagery – Lord Ampthill, *Ex- Governor* of Madras

There is a very large body of medical literature in Sanskrit and some of the principal works are named by Arabic writers as having been known and translated at Baghdad in the ninth century. These works comprise all the branches of medical science, surgery included and contain numerous instances of accurate observation and judicious treatment – Professor Wilson..

Their surgery is as remarkable as their medicine – Elphinstone.

The surgical instruments of the Hindus were sufficiently sharp, indeed, as to be capable of dividing a hair longitudinally ... Mrs. Manning.

Indian medicine dealt with the whole area of the science – Sir William Hunter.

Only those are dead, who believe themselves to be so. Indian medicine is not dead. It is yet alive, though not fully awake to-day. It is precisely because it is a living force that it provokes antagonism from those who fear or dislike its culture. Does anyone now fume against or ridicule the medical systems of Greece, Egypt, Persia or Arabia ? They are left, as things which are dead and gone, to the scientific dissection of the cool historian. But while touching Indian medicine even the scholars could not be impartial. Why? Because Indian medicine is not the mere subject of the academic talk, but is a living force. Indian medicine is still feared where she is not loved. Why again? Precisely because she lives, because she is potentially powerful to impose her ideas upon the world. She is still an antagonist to be reckoned with in the conflict of medical cultures. Why has she with her pathology so unique and so different from any other of the West, been preserved ? Indian medicine lives because of the world purpose which she has to fulfil: because the world will be enriched by what she can give to the other medical systems. We Indians are the custodians of this treasure ...... It deserves to be preserved and investigated in the right spirit of the seekers after truth. When that is done it will be seen that the Western medicine has yet more to learn from the old Aryan Medical Science – Dr. Jamshedji Jivanji Modi, L.M.&S. (Bom.) L.D.S. (Engl.)

APPENDIX – C

INDIA – THE REAL HOME OF MEDICINE

Captain P. Johnston–Saint of the Welcome Historical Museum, delivered the Sir George Birdwood Memorial Lecture before the Indian Section of the Royal Society of Arts recently, on "*An outline of the History of Medicine in India*", with Sir E. Denison Ross, Professor of Persian and Director of the School of Oriental Studies, University of London in the chair.

Extracts from the Lecture

By an invitation of the Royal Society of Arts to deliver the Sir George Birdwood Memorial Lecture one cannot but feel an unusual sense of honour in being selected as the Lecturer, more especially as the subject forming the basis of this brief discourse would, I feel sure, have been one of very particular interest to Sir George Birdwood to whom medical science in India meant so much.

In those days (of the first European Invasion in India), of course and for long after, we Europeans held in the lowest esteem every pretension of the East to any real knowledge at all. The many and varied races of immemorial India we thought fit to lump together as 'Barbarians', and our earliest doctors to go out there wrote, when they wrote at all, of Indian medicine as a matter of childish charms and philtres, almost a sort of Voodoo devil dancing....

......After the first European invasion a malady became known to the Hindu doctor as 'Portuguese Disease' (Syphilis). It was the contribution of Western enlightenment to the darkness of the benighted East.

Early Western Ignorance

For well over two hundred years this remarkable ignorance remained and as late as Victorian times professedly well informed scholars were writing that Europe owed nothing to India.... Indian history in fact we practically said began with the English domination and before this was a farrago of myths and legends.

All Indian science was but a superstition, all its medicine but a matter of spells and charms. And *this from English doctors who up to our own living memory were beginning their prescriptions with a traditional scrawl of the pious invocation, "Jupiter be propitious to us!"* It was indeed a literal case of the mote in our neighbour's eye.

In 1762 and epidemic fever was raging in India and a European doctor notes the death of thirty thousand natives in a single day; this exceptional mortality he explains was due to an eclipse, while other practitioners of his day were writing learned little notes on the effect of the tides of the sea upon the pregnancy of women. Be very sure that all these gentlemen were deservedly severe upon the absurd superstitions of Hindu so-called medicine.

Causes of Western Ignorance

Humiliating as it is for us to admit an ignorance at one so extraordinary and so self-sufficient, at least our ancestors have a sufficient amount of excuse....

In the first place Sanskrit treatises on medicine had been hitherto little noticed by Sanskrit scholars...... In the second place our system of classical education had already given us an apparent beginning of all arts and sciences. A disproportionate part of our education was devoted to ancient Rome and Greece where we learnt all about Apollo and Aesculapius and in Greek history we came to Hippocrates. Here we had got a founder of medicine all ready for us, and that there might have been any one before him few of us were disposed to enquire.

Certainly with all this classical knowledge, so laboriously acquired. We were not prepared to venture still further afield, and most assuredly not into the clouds of the story of a land which we universally regarded as both black and barbaric: so there we have reason number two for our appalling ignorance.

The third reason which brings us to the main thesis of our lecture is that about the first European introduction to India, medical science in that country had fallen to perhaps the lowest point in the curve in all its long history, and so vast is the scope of this subject that it is only the fringe of it that I dare attempt roughly to trace.

Into the question of the dates of the beginnings of Indian Civilisation this is not the place to go for the truth is that with all our speculation we do not know anything definite. It was

only some 120 years ago that we of the West first began to apply ourselves to the study of Sanskrit, and though since then whole libraries have been written upon the problems of the Aryan beginnings, we cannot yet be satisfied that we have reached a definite establishment of truth.

We used to be satisfied that the oldest Vedas date back to perhaps 2000 B.C. as Whitney, Grassmann and Benfey provisionally assume 2000 B.C. as the starting point of Hindu literature. Brunnhofer has suggested 2800 B.C. Prof. Jacobi of Bonn supposes the period to go back to 4000 B.C. while according to one school it may be that we would date them back to some even more remote glacial age when the very world itself was not the earth we know to-day. The Avesta, they say, points to an Aryan paradise that can only have been the North Pole, a region removed by tens of centuries from anything of which to-day we can have the least conception.

Brahma, taking compassion on man's sick, degenerate, and suffering state produced the Ayur-Veda which contained a treatise of the science of life. The hymn itself in its entirety has perished and we know it but by fragments and comments in later Indian literature, but even from this second hand repute we are assured that for untold ages it was this Ayur-Veda that was regarded as the very foundation stone of medical science.

We cannot say with any degree of certainty whether Charaka or Sushruta was the earlier ..... Whatever their precise dates may be it is certain that their particular schools of science were early enough to have been known and appreciated by other nations. The Arabians, for instance, quoted them and in turn were quoted by the Roman doctors.

We later arrive at the 'Indi dixunt' pointed out first by Professor Dietz in his 'Proofs of the Antiquity of Hindu medicine,' We have then at some rather indefinite but undoubtedly very early date a Sushruta as the father of Indian surgery and a Charaka as father of Indian medicine.

'Chemistry' it is true may have been an Arabic work, but the science itself appears in India long before the time of the Arab scholars, for the seventh chapter of the Ayurveda treats exhaustively of this science.

Sushruta according to the Hindus, was the son of Vishwamitra, a contemporary of Rama. Precisely when he may have lived we do not know; Sir William Jones places the subjugation of India by Rama about the Year 2000 B.C. On the other hand some philosophic scholars assert Sushruta to be a contemporary of Buddha. As many Vedic hymns are ascribed to him it follows that he must have flourished during the Vedic age. Again in the tenth book of the Atharva-Veda there is a hymn on the creation of man in which the skeleton is described according to Atreya and Sushruta. A large portion of a period as early as 1000 B.C. and the hymn in question is included in the older portion. This would appear to warrant the assumption that Sushruta cannot have flourished later than 1000 B.C. Nor have we got his original text ; the Sanskrit version of what we call Sushruta being really a recension of recensions made at some considerable period after the date of the original.

It is the two surgical chapters of the Vedas with which he (Sushruta) chiefly deals, though as is common even to-day the surgeon also treats to some extent of medical ailments. The first of the six chapters is all surgery proper, but includes

observations on climate and food as affecting health. The second chapter deals with ailments brought about by vitiated humours; his third we might roughly translate as anatomy, his fourth as therapeutics, his fifth as toxicology and his sixth and last is supplementary, dealing with various local diseases.

It is however, surgery in which Sushruta specialises, calling it "the first and best of the medical sciences less liable than any other to the fallacy of conjectural and inferential practice, pure in itself, the worthy product of heaven and certain source of fame." The irreverent layman would seem here to see the distinct fore-runner of western theories.

CHARAKA

Very much the same considerations are to be drawn from the study of Charaka; who precisely he was and exactly when he lived we do not know..... The first book, divided into thirty heads, deals with the origin of medicine and the duty of the physician and here we can trace some sort of analogy to the oath of Hippocrates. The arrangements, properties and uses of medicine are each discussed and the cause, nature and prevention and cure of diseases, diet, steam baths, the broad classification of foods–these are only a few of the subjects treated in this first book.

DISEASES

The second book goes on to describe diseases such as fevers, tumours, leprosy; mania and epilepsy. The third book considers the nature of epidemics, the peculiarity of the fluids of the body and other subjects. The fourth treats of conception, the variety of the species, the parts of the body, and the connection between body and soul. The fifth book is a

description of the senses, their peculiarities and ailments, affections of the speech, causes of diseases of organs, sudden losses of strength and death. The sixth book treats of the means of securing increased vigour and enjoying long life, and different classes of ailments are dealt with, such as dropsy, jaundice, asthma, erysipelas, thirst and poisoning, inflammations, the effects of intoxication, abscesses, rheumatism and paralysis too, all find a place in this book. The next, the seventh, treats of emetics and purgatives, and in its twelve chapters we see a remarkable number of such material as were known to the ancient Hindus. The last and eight book, also in twelve chapters, deals with evacuating medicines for fevers, injections for various purposes, clysters and so forth.... That the sequence follows a system there is no possible doubt.... The evidence of real knowledge is remarkable. A little later on I propose to give many instances where this ancient Hindu science, whatever term is chosen for its designation, medicine, religion or philosophy actually antedates by centuries many a modern triumph on which present day Western civilisation preens itself as the discoverer

From these two, Sushruta and Charaka sprang many schools and sages. Dr. Wise of Bengal Medical Service writing in 1845 mentions two systems of Hindu surgery, nine systems of medicine, three of materia medica one of nosology, one of pharmacy, three on metallic preparations. There is no room for possible doubt that their (Charaka's and Sushruta's) system gave a very thorough knowledge of anatomy, as indeed must have been necessary for the performance of the operations which we know were freely undertaken, some of them of the utmost delicacy. For not only were limbs amputated, but abdominal sections performed, fractures were

set, ruptures were reduced and foreign substances were dexterously extracted. To Sushruta is due the glory of the discovery of cataract-couching, centuries before it was known to the west, while the plastic surgery of skin grafting and rhinoplasty, only comparatively lately rediscovered in Europe, were frequently practised by the same great Hindu.

Theatre Rules

His rules lay down exact regulations for the operating room; it was to be fumigated with such and such disinfectant vapours a light refreshment was to be offered to the patient before certain operations while before other operations he was to be fasting. The surgeon should keep his hair and beard short, his nails clean cut–a doctrine which has been rediscovered by our modern bacteriologist–and wear a clean, sweet-smelling dress.

Even anaesthetics in some form or other were known and at some later period we see in the Bhoja Prabandha, a treatise written about 980 A.D. a reference to an inhalation before operation of an anaesthetic called Sammohini recorded to have been used in the time of Buddha.

Jivaka the famous physician who was contemporaneous with Buddha is stated to have studied medicine in the Taxila University.

KNOWLEDGE OF THE ANCIENTS

We find then that gravitation was known to the Hindus long before the birth of Newton and that the system of the circulation of the blood was discovered by them centuries

before Harvey was heard of. Harita in 'Harita Samhita,' in a description of anaemia observes that the disease is caused by clay obstructing the lumen of veins and so clogging the circulation of the blood. The atomic theory again was preached in India centuries before the birth of Christ. and their knowledge and comprehension of the sciences of mathematics and astronomy were remarkable.

With amputation came artificial limbs and in the Rig Veda we have such a reference. An artificial leg. we learn, was made of iron, there were, too, artificial eyes. Rhinoplastic surgery I have already touched upon, and according to Dr. Hirschberg of Berlin "The old plastic surgery in Europe had taken its new flight when these cunning devices of Indian workmen became known to us". The transplanting of sensible skin flaps is also an entirely Indian method.

SKIN GRAFTING

In particular the Hindu surgeons were adepts in the forming of new ears and noses from the grafting of flaps of skin.... From the Mohavagga we may learn that Jivaka the physician of Buddha practised cranial surgery with success, and long before the birth of Jenner the cow-herds of India were practising a kind of inoculation or vaccination for small-pox. Collecting the dry scabs of the pustules they placed a little of these upon their forearm, then puncturing the skin with a needle, so securing a certain immunity. According to at least one scholar, a Dr. Huillet of Pondicherry, actual vaccination itself was also known to the Hindu surgeons so much then on the side of surgery.

The Hindu physicians were the first to devote their attention to the study of diseases and their treatment, and in medicine their learning in many cases far antedated our own, as was only natural from the immense study given to the properties of every product of the soil. The smoking of datura for example in cases of asthma we owe entirely to India, as also the prescription of nux vomica in paralysis and dyspepsia, and very largely the use of croton. Even the effects of excessive smoking come under the notice of the Indian Physician.

In toxicology they had extra-ordinary skill and in the story of the invasion of India by Alexander, while all the physicians were powerless in cases of snake bite the Indian doctors readily cured those who fell under this affliction. For this reason Nearchus says "Alexander collected round himself the most prominent of the Hindu doctors and proclaimed the soldier bitten by a serpent was instantly to repair to the royal pavilion for treatment" Their number of antidotes for different classes of cases was extraordinary as might be expected from a science one of whose masters, Charaka described in his teachings no less than 600 separate purgatives.

SECRETS OF DREAMS

In the field of what today we should call Psycho-therapy the Hindus again held pride of place, and centuries before Freud was heard of, the Hindu doctors were anxiously probing into the secrets of dreams. With much that we were taught to regard till quite recently as absurd, their teachings show signs of a good deal of our newest learning, and in, for example, the theories of the Terror Dream they came at least

remarkably near our 20th century doctrine of the subconscious mind.

Again in midwifery the Hindu was well in advance, and his early writings display a remarkable knowledge of the techniques of this branch of medical science, including the caesarean section and what we should now call pre-natal treatment. The expectant mother, it was taught, was to be kept in a happy frame of mind, her surroundings were to be placid and pleasant and in effect the instructions and Mother-craft Clinics of London are giving today and have been giving for a matter of possibly the last ten years or so were being taught as a matter of course in the ancient India of centuries upon centuries back.

HYGIENE

Medical hygiene occupied an enormous proportion of early Hindu practice, and the science of climatology at once so old and yet so young was widely practised and understood. There were three distinct sorts of country, Anupa, the moist and marshy districts where 'phlegmatic' diseases and 'affections of the wind' would be prevalent; Jangala, the over-dry country where ailments of the 'bile and blood' would be common and Mishra, neither too moist nor too dry, too warm nor too cold. Patients suffering from various ailments would be directed to try a different country perhaps from Anupa to Jangala or vice versa and Mishra would be recommended generally for the period of convalescence.

The codes laid down precise recommendations for the habits of patients of different types, the foods to be eaten, the clothes to be worn, even the hours for sleeping and for getting up. There was no province of human life, however intimate,

for which recommendations were not to be found in the ancient Hindu medical code. What we know today as Preventive Medicine had its origin in India many centuries back.

TOOTH-BRUSH HYGIENE NOT NEW

The ritual cleanliness of the Hindu is well known, but long before the days when Brahmanism ruled every action of its votaries through the claims of claims of cast and creed we may find the elements of the code in early Indian medicine. Take for instance so primary a case as the use of the tooth-brush (now taught in English council school as quite a late example of 20th century western hygiene). We find quite an elaborate set of regulations upon the subject.

A twig of Bavala, the Acacia Arabica, was sufficient for general use, but for particular cases twigs of other woods were recommended; the Indian fig tree, Ficus Religiosa, for one case, the Pomgammia Glabra for another, the Nauclea Cadamba for a third; in all no less than twelve distinct types of trees are singled out to provide tooth-brushes for particular types of users and there is a similar thoroughness about the regulations for the tooth-powder. We here in England having delayed the matter altogether for about twenty centuries have comparatively recently arrived at the point of oral hygiene and the use of tooth-brush!

HINDU SURGICAL INSTRUMENTS.

And if their preventive medicine, their midwifery, and their toxicology were thus thorough we may be certain that at least equal pains were ever set down in writing of the Hindu

Fathers of Surgery. I have already casually mentioned the remarkable number of the classes of instruments, but the subject deserves far more than any cursory glance.

..... Of the blunt twenty-four kinds were cruciform, two kinds pincher-like, two pick-lock like, twenty tubular, twenty-eight rod or pitcher like, twenty-five accessory and they were the same sort of variety of the sharp instruments. In general they were made of iron and their jaws as a rule were fashioned to resemble the faces of birds and beasts.....

One remarkable point I might mention is that precisely on the pattern of the Sinhamukha Swastika, or lion faced forceps, described by Sushruta, are the forceps now used by modern European surgeons for holding bones firmly during operations, the surgeon names his instrument 'lion forceps.' Although of course, no original specimens of these instruments have survived, a very comprehensive set of exact replicas are to be seen at the Welcome Historical Museum.

INSTRUMENTS OF TODAY

On examining these instruments they will be seen to be remarkably similar to those in a catalogue of a modern surgical instrument maker. More remarkable still perhaps is the fact that in many cases we can trace their exact geneological descent down to our own day, for we have descriptions of many of the instruments of the ancient Greeks, Romans and Arabs, and in case after case they tally exactly with those shown here as ancient Hindu.

More, with the destruction of Pompeii many instruments were buried under volcanic ash and being centuries later disinterred are now to be seen preserved in the Naples

museum. These too tally in exactly every detail with many of our descriptions of the instruments of the Hindu Surgeons as given in the old Sanskrit manuscripts.

FALSE TEETH

Exact instructions are laid down for the building of a dispensary, even for the cases in which instruments are to be kept. Dentistry is described and students were advised to practice extraction on certain fruit seeds and on the teeth of dead animals.

At some period unknown, but certainly before the twelfth century A.D. false teeth were known to the Hindus. A description of the defeat of Jayachandra by Shahabuddin in 1194 mentions the dead body of the Raja being 'recognised by his false teeth.'

HINDU MATERIA MEDICA

If, then, this is what we find in surgery, what may we not expect in medicine from India, that vast and fertile country which by the very nature of its size and climate is indeed a veritable encyclopaedia of the vegetable world ? Nor shall we be disappointed. The materia medica of the ancient Hindus is a marvel to the modern scientific investigator; and that it was freely borrowed from by both Greeks and Romans cannot be denied.

Charaka makes an arrangement of 'simple medicines' only, under no less than forty five heads; Sushruta being more than given to surgery, divides his medicines under thirty-seven heads. These masters passed on their teachings to their

pupils who in turn supplemented them with new drugs, the fruit of their own experience. So we have Vagbhata about the second century B.C. and his stupendous *Ashtangahridaya*, a sort of encyclopaedic compendium of the medicine of Agnivesha, Charaka, and Sushruta : Madhava and his diagnosis of disease was another giant, and there was Bhava Mishra of Benares, the 'Jewel of Physicians,' and plenty more. The list of Indian Medical writers could continue almost indefinitely.

FIVE PROPERTIES

In the materia medica are described drugs belonging to the animal, vegetable, and mineral kingdoms the theory being that every substance had to be judged by its five properties, Rasa, Guna, Veerya, Vipaka and Prabhava. The first of these stood for taste, sweet, sour, salt, bitter, pungent or astringent, the sweet being more restorative than the sour, the sour than the salt, and so on. The second property, Guna, was virtue, the inherent power of the drug to cause a certain effect when taken internally; under this heading Charaka gives fifty groups of ten herbs each which he says, "are enough for the purpose of an ordinary physician." Agnivesha, on the other hand, gives no less than 500 classes alone of medicinal agents. Veerya stands for the power of a drug, being either heating or cooling. Vipaka was the consequence of change or action which the drug underwent in the human organism, and finally Prabhava was its adherent nature or active force.

So two drugs might both be sweet, both be heavy and both be cold, and both remain similar in consequence of gastric action, and yet in Prabhava the one might be costive the other laxative. With the combined action of these five

properties, in the case of many hundreds of drugs as applied to different patients with different types of disease, the physician had to make himself familiar, for as the sages had it "Medicine when administered by an ignorant person is compared to poison, being like a knife, lightning or fire; but when administered with the necessary knowledge medicine is like the Amrita or water of immortality."

BOTANICAL GEOGRAPHY

Long lists of medicines are hardly to our purpose, but in the Kalpasthanum we might notice the classification of drugs and medicinal plants under their headings of Bulbous Roots, Bark of Roots, Bark of Trees, Trees possessing a peculiar smell, Leaves, Flowers, Fruits, Seeds, Acrid and Astringent Vegetables, Milky Plants, Gums and Resins.

The list is interesting as it is in this book that we probably find our earliest notices respecting Botanical Geography, the sites and climates of different plants, the soils and seasons for collecting medicinal plants, the time that they remain good, how they are to be kept and the weights and measures of pharmacy. This Botanical Gardening coupled with the Indian pharmaceutical gardens which I shall refer to presently seems to possess a particular interest in medical history and again it is to Indian that we owe it.

GREECE'S DEBT TO INDIA

Many of these medicines can be traced directly, not only down to the Arabs but also to the Greeks and Romans. Dioscorides in his first book mentions many Indian plants particularly among aromatics for which India has always

been famous. Galen and Pliny also borrowed much, but it is the work of Dioscorides that is best calculated to show to how great an extent the ancients were indebted to India and the East for their medicine.

There were some who used to think that the Hindus had their knowledge from the physicians who accompanied Alexander the Great on his conquests in the East, but we now know that it was to India that the Greeks, and so indirectly ourselves, owe most of their medicines. How this came about I hope soon to show. And while many drugs that had their origin in India have found their way into our own British Pharmacopoeia, there were probably hundreds more Indian medicines still unacknowledged. Much as we have learned, it is possible that there still remain rich rewards to repay patient research.

STATE SYSTEM OF MEDICINE

With the coming of Buddhism practical surgery went a still further fall. The teaching of the Buddha, the Enlightened, did not, it is true, prohibit the use of the knife, and it was for instance permitted to lance a boil. But on the whole it is unfair to say that surgery under the new creed was so shackled and hedged about with limitations that it almost disappeared.

The student was to practice puncturing "on the veins of dead animals and on the stalks of the water lily," while his extractions were to be made experimentally on the pulp of various fruits and on the teeth of dead animals. Flowers, bulbs, and gourds were all pressed into service as models for the dissecting table. Incisions were demonstrated on bladders

packed with mire and poste, lancing on hollow stalks of plants, sacrifications on the fresh hides of animals "from which the hair had not been removed." Models for the human limbs were fashioned for lessons in bandaging and so the regulations went on indefinitely. Little wonder that under fetters so drastic the art of the surgeon should have experienced a retrograde tendency.

PERFECT NETWORK

But while surgery was limited, other branches of medicine under the Buddhism that now ruled the greater part of India advanced by leaps and bounds, a creed of tenets that embraced in their care the veriest insects could but pay infinite care to the ailments and ills of man himself; and so we find the whole of India soon covered with a perfect network of medical machinery. In the scheme of life in fact of the Buddhist priest of 200 B.C. was included the assistance of the sick, and so we have hostels for the sick and blind, the deformed; there were hospitals for pregnant women, hospitals for travellers. Buddha Das, we are told, established the system of State Physicians, one being appointed for every ten villages on the great roads of India.

Pharmaceutical gardens were established to supply the herbs and drugs in Ayurvedic medicine. Aboriculture and irrigation were carried out under State supervision. In the line of Preventive Medicine laws were passed regulating burial and sanitation, many modern regulations in the latter direction being antedated by centuries in the codes of the Buddhist Kings.

ANTI-ADULTERATION LAWS

The Royal Household set an example to their subjects in the direction to their houses and gardens. Medicinal herbs were grown in pots and certain plants were grown that had the property of warding off snakes; cats, peacocks and other creatures were kept in compounds for the same purpose, and parrots were encouraged on the grounds that their shriek was a warning of the presence of the snakes.

And anti-adulteration laws were drawn up on lines of strictest severity, and even carelessness on the part of the doctor was vigorously dealt with. "All physicians," the code said, "who treat their patients wrongly shall pay a fine." But as one commentator has said, "This refers to cases when death is not the result of the wrong treatment for if that is the case the punishment is greater."

VETERINARY SCIENCE

Under Buddhism veterinary science, as we might have expected, reached an enormously high level and infinite pains were taken for the care and treatment of the animal creation. Horses, elephants, cows, fishes. game-birds, almost everything had its veterinary surgeon, the game-keeper, the superintendent of the forests, the superintendent of horses, each became a high officer of the Buddhist State.

Under the government of Chandra Gupta (C.316 B.C.) our modern system of bird and animal sanctuaries was forestalled and whole tracts were devoted to the preservation of birds, fishes, deer and other animals that did not apparently prey on life. It was no case of Forest Preservation in our English history book sense of the Norman Conquerors. Life

within the Buddhist reserves was literally and absolutely sacrosanct; the Little brother of the Christian Saint Francis had veritably come into his own under the codes inspired by Buddha.

ANIMAL HOSPITALS

Regulation after regulation was laid down dealing with the minutest details of the proper rations to be given to different animals at different ages, in sickness and in health, and over their ailments was lavished a care which centuries later a European Peasant might well have envied. All over India at the height of the Buddhist wave were set up Animal Hospitals managed for the most part by the state and staffed by the state's own veterinary doctors; the term is probably more accurate than that of the more obvious veterinary surgeons which almost came to my lips. It was the Apotheosis of the Animal World. Centuries later we can still find traces of these Animal Hospitals in various parts of India and particularly amongst the Jains. This then was the state of Medicine in India at one of its most glorious epochs.

SPREAD OF INDIAN MEDICINE

I hope that although with several digressions I have been able to interest you in the early medical science of India and at the risk of a certain loss of strict continuity to present something like a clear story of its glories. I am now anxious, if your patience permits, to touch upon its marvellous spread throughout the whole then known world. For India was no hermit State, and knowledge of its sages was a fountain-head from which every country has liberally drawn.

As Jacolliat remarks, "We should not forget that India. that immense and luminous centre in olden times, besides spreading its ideas throughout the East by means of emigration, from the earliest times, was in constant communication with all the people of Asia and that all the philosophers and sages of antiquity went there to study the science of life."

"Exuberant Ideas"

As I have already tried to indicate, upto some centuries ago we assumed that Greece was the beginning of all things in medical history and if anything at all came before Greece it was some dim immemorial Egypt of which we knew little enough. Any serious medical science that India may ever have possessed must have come, we took it, from Greece, probably from those Greek physicians who accompanied Alexander and his armies to the East. This was our old point of view.

It was Dr. Wise whose researches first upset the theory, and who first dared to hazard the opinion that Greece and Egypt alike may both, in their scientific relations to India, have been the learners and not the teachers. As he puts it "Asia can benevolently give, but it does not need to borrow; its ideas and fantasies are as exuberant as its vegetation."

PYTHAGORAS' INSPIRATION

Today the speculation is over and we trace how the great Pythagoras himself imbibed his mysteries from the Brahmans of India. The connection is not difficult. As long ago as the time of the thirty-seventh chapter of Genesis we find mention of the Ishmaelite or Medianite merchants trading with their

caravans of spices of India and balm and myrrh of Hadrmaut. Their traffic had its regular course towards Egypt and in this trade route of the remotest antiquity we arrive at some connection between India and the West. The Phoenicians, we know, had in the Persian Gulf their "forts" for the Indian trade, while as early again as 1686 B.C. the Arabs, we are told, had opened out a trade to India.

Further, from the recent discoveries which have been made during the excavations carried out on the North-West of India, we have ample evidence that as long ago as 3000 B.C. there was considerable intercourse, both in trade and culture, between the people dwelling in this region and those of Babylonia and Egypt. In the East itself the Indian learning was carried to Ceylon, to Java, and later on to China and Tibet.

RAISING THE VERY DEAD

Buddhists came and the Brahman preists fled to the furthest parts of known world. The Buddhist Dynasties sank, Brahminism was recreated and Buddhist scholars, like those Greeks who with the fall of Constantinople brought the renaissance to Western Europe, fled with their learning to China, to Tibet, to everywhere. There are even those who say that Ancient Mexico owes much of her pre-conquistador civilisation of the arts of India and the discoveries made by Dr. Thomas Gann in his recent expeditions to Central America disclose in a strartling manner the striking similarity of the design and architecture of some of the Maya temples to those of ancient India.

Hippocrates, The "Father of Medicine," we know to have visited India. For what? Save the fame of the Indian

physicians. According to a tale there was a physician whose skill was such that "he could raise the very dead." Stories such as these, however wildly exaggerated, speak wonders and in Greek medicine, in Arabian medicine, in what we know of Egyptian medicine, we find time after time traces of what can only have been derived from the even more ancient and famous Indian medicine. If we were to speak the truth we must call Greece not the parent of our modern medicine but its nurse.....

CAUSES OF DECLINE

Into the letter of the ancient learning as expressed in the old manuscripts corruptions began to creep. The glories of Hindu science were in rapid decline. With the coming of the Moslem conquerors the fall became more rapid. The invaders had brought their own doctors, and if their science was in many cases taken from that of the conquered of centuries back, at least it was the science of the masters, and felt no need to take into consideration the science of the mastered.

And so Hindu medicine again slipped down many grades. Where the Moslem Hakeems flourished under princely protection the Hindu Vaidya held only the lowly offices of spell-makers to the poor.

With the coming of the Europeans, first the Portuguese, then the Dutch, the French, the English, the Kings of India, both Moslem and Hindu, were concerned with rather the protection of their territories, the raising of armies and making of treaties, than with the care of science. The fire of Indian medicine had sunk almost to its last embers. The sneers of our pioneer writers almost justified .

From 1715-1818 there seemed in the time of the Peshwas to be something like a faint revival of the ancient glories of Hindu medicine, but with the final victories of the English its hopes were extinguished, and as British rule spread all over the Peninsula, European medicine was gradually introduced, and all that was left for the Hindu "Vaids" was about the position of an English herbalist. To such a pass had come the learning of Charaka and Sushruta.

EFFORT AT REVIVAL

In bringing my subject to a conclusion I think it would be of interest to note that of late years an effort has been made to revive interest and research in this ancient science, for the Hindu system of Medicine is still to-day a living science, and millions of people in India are at the present time being treated according to this method.

A system which has thus survived through the centuries cannot be lightly condemned as being unscientific, and a school of thought is at present engaged in trying to bring about a sort of renaissance of Ayurvedic system of medicine. In Madras, Calcutta, Benares, Bombay and other cities there have been established training centres for this purpose where the works of Sushruta, Charaka and other medical classics are systematically studied, so that we may have every ground of hope that before long the true Indian medicine may once again hold its place on its own India, the birthplace of the medicine of the world.

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